CONTENTS

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE St.
DENVER, COLORADO

TRADE NAME	MODEL	SET AND FOLDER No.
Admiral	Ch. 18Y4BSA, EFA, ESA, ESB, LSA, PSA, 18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA Tel. Rec.	360-2
Browning	L-500 Prod. Chg. Bul. 185	360-1
Electro-Voice	A20CL	360-3
Emerson	1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211 (Ch. 120306-CM, -EM, 120307-RM) Tel. Rec.	360-4
Firestone	4-C-31 (Code 1-6-4PL)	360-5
Hotpoint	17S301, 17S302 ("MM" Line) Tel. Rec. Prod. Chg. Bul. 185	360-1
Magnavox	Ch. V19-01AA, V19-02AA, U19-01AA, U19-02AA Tel. Rec.	360-6
Motorola	55B1U, 55L1U, 55L2U, 55L3U, 55L4U, 55L5U, 55M1U, 55M2U, 55M3U, 55M4U (Ch. HS-508, HS-509, HS-510) Prod. Chg. Bul. 185	360-1
Motorola	76T1, 76T2 (Ch. HS-507)	360-7
RCA Victor	Ch. KCS97, A, AA, AB, AC, AD, C, D, E, F, H, J, K, N, P, R, T, U, W Tel. Rec. Prod. Chg. Bul. 185	360-1
Sonora	568, 585	360-8
Steelman	3D15U	360-9
Sylvania	14P101 Series, 14P201 Series (Ch. 1-525-1, -2) Tel. Rec.	360-10
Sylvania	2302DG, H, PI (Ch. 1-602-9)	360-11
Wells-Gardner	321A63/U-B-622, 321A63/U-B-678, 2321A63/U-B-680 Tel. Rec.	360-12
Whitley	"Murasonde" AP1000	360-13
Zenith	HF772E, H, R, HFZ772E, H, R (Ch. 7Z20)	360-14
Zenith	YP8L	360-15

PRODUCTION CHANGES
BULLETIN 185

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 10 IN SET 312

RCA Victor Models 21-D-641, U, 21-D-645, U, 21-D-647, U, 21-D-648, U, 21-D-652, U, 21-D-667, U, 21-D-670, U, 21-T-635, U, 21-T-6125, U, 21-T-6127, U, 24-D-655, U, 24-D-658, U, 24-D-673, U, 24-D-676, U, 24-D-679, U, 24-T-6142, U, 24-T-6285, U and 24-T-6287, U (Ch. KCS97, A, AA, AB, AC, AD, C, D, E, F, H, J, K, N, P, R, T, U, W) were covered in Photofact Folder 10 - Set 312.

The following changes were made during late production.

COMPONENT CHANGES

The adjustable range of A5 is increased from 5-70MMF to 10-160MMF, part #100849.

C66 is increased from .0082 MFD to .015MFD.

C97 is decreased from 680MMF to 560MMF.

A .01MFD @ 500V capacitor is added from pin 7 of V9A to ground.

A 220MMF capacitor is added from the center tap of the secondary winding of L31, ratio detector coil, to ground.

A 300 microhenry series peaking coil is added between R42 and R43, part #101289.

R65 is decreased from 1000Ω to 100Ω.

R71 is decreased from 330K to 68K.

R94 is increased from 470K to 820K.

An 82Ω, ½ watt resistor is added from pin 7 of V9A to ground.

A 220K resistor is wired in parallel with L30, sound IF coil.

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RCA VICTOR CHASSIS KCS97, A, AA, AB, AC, AD, C, D, E, F, H, J, K, N, P, R, T, U, W

PRODUCTION CHANGES
BULLETIN 185

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 4 IN SET 309

Browning Model L-500 was covered in Photofact Folder 4 - Set 309.

The following changes were made during late production effective with serial #493 and up.

COMPONENT CHANGES

A 220K ½ watt resistor is added between terminals 1 and 3 of M4, section 1 front.

A 47K ½ watt resistor is added between terminals 1 and 4 of L5, BC RF coil.

CIRCUIT CHANGE

R1, volume control, has been relocated in the cathode follower circuit along with component changes. A partial schematic showing the new circuit is on the reverse side.

BROWNING MODEL L-500

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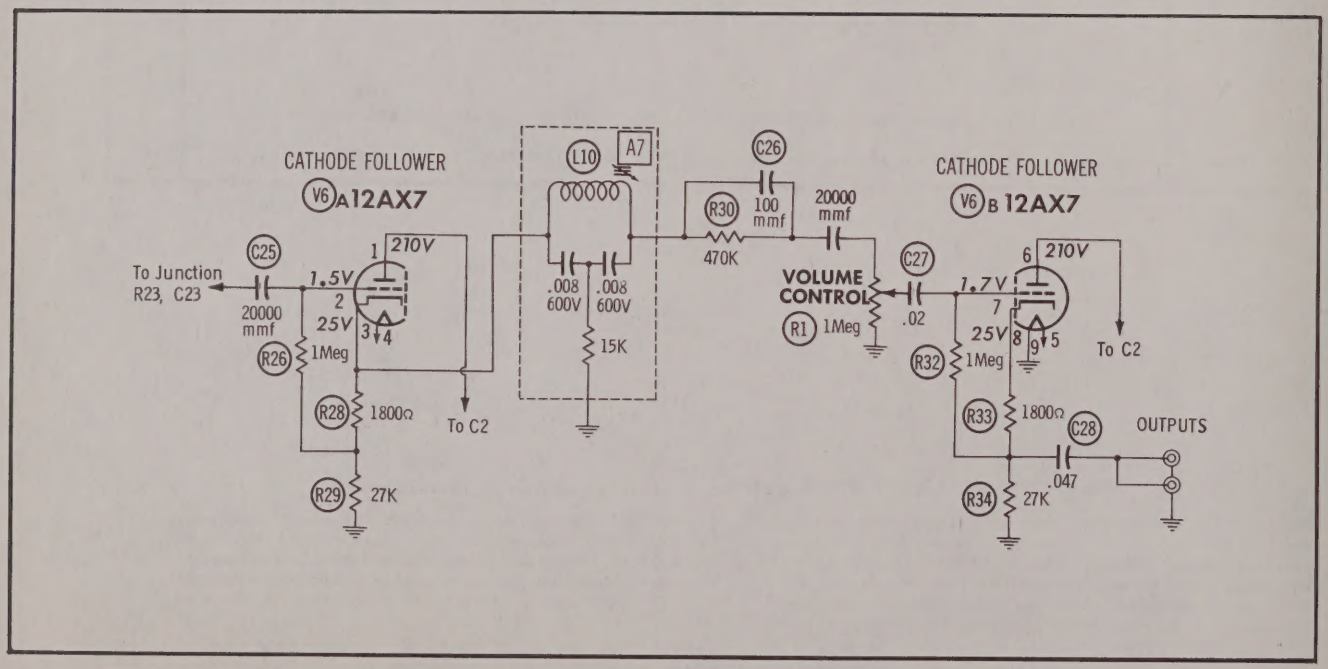

CATHODE FOLLOWER
V6A 12AX7
L10
A7
C26
100 mmf
20000 mmf
R30
470K
CATHODE FOLLOWER
V6B 12AX7
To Junction R23, C23
C25
20000 mmf
1.5V
210V
25V
R26
1Meg
R28
1800Ω
R29
27K
To C2
.008 600V
.008 600V
15K
VOLUME CONTROL
R1
1Meg
C27
.02
1.7V
210V
25V
R32
1Meg
R33
1800Ω
R34
27K
C28
.047
OUTPUTS
To C2

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET 347

HOTPOINT MODELS 17S301, 17S302 ("MM" Line)

Hotpoint Models 17S301 and 17S302 ("MM" Line) were covered in Photofact Folder 6 - Set 347. The following production changes were made during late production.

TO INCREASE WIDTH

R87 is decreased from 12K to 10K.

TO INCREASE RANGE OF VERTICAL LINEARITY

R64 is decreased from 3.3Meg to 2.7Meg.

RESISTOR-CAPACITOR COMBINATIONS

The following resistors and capacitors are combined in a single unit.

R58 and C63, same values.

R49 and C57, same values.

R8 and C8 with values of 500K and 470MMF.

R9 and C9 with values of 500K and 470MMF.

COMPONENT CHANGES

C55 is omitted.

C86 is omitted.

R39 is omitted.

R63 is omitted.

R37 is increased from 82Ω to 100Ω.

R38 is increased from 2200Ω to 3300Ω.

M3, dual selenium diode, is replaced by two germanium diodes, part #RED-006.

L12, 1st. Video IF Coil, is changed to part #RLI-391.

L22A, B, 4.5MC trap and sound IF, is changed to part #RLI-413.

LOCAL-DISTANCE SWITCH

On later production M7, local-distance switch and network R10, R11 and R12, are omitted. In extremely strong signal areas where attenuation is needed, the local-distance switch and network are available (Part #REM-010).

NEW GERMANIUM RECTIFIERS

M1 and M2, selenium rectifers, are replaced with germanium rectifers, part #RER-026. A partial schematic showing the new circuit is given on the reverse side.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 6 IN SET 303

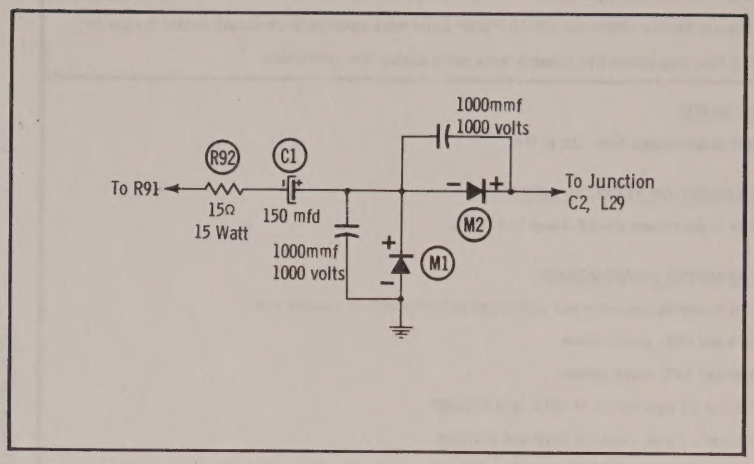
MOTOROLA CHASSIS HS-508, HS-509, HS-510

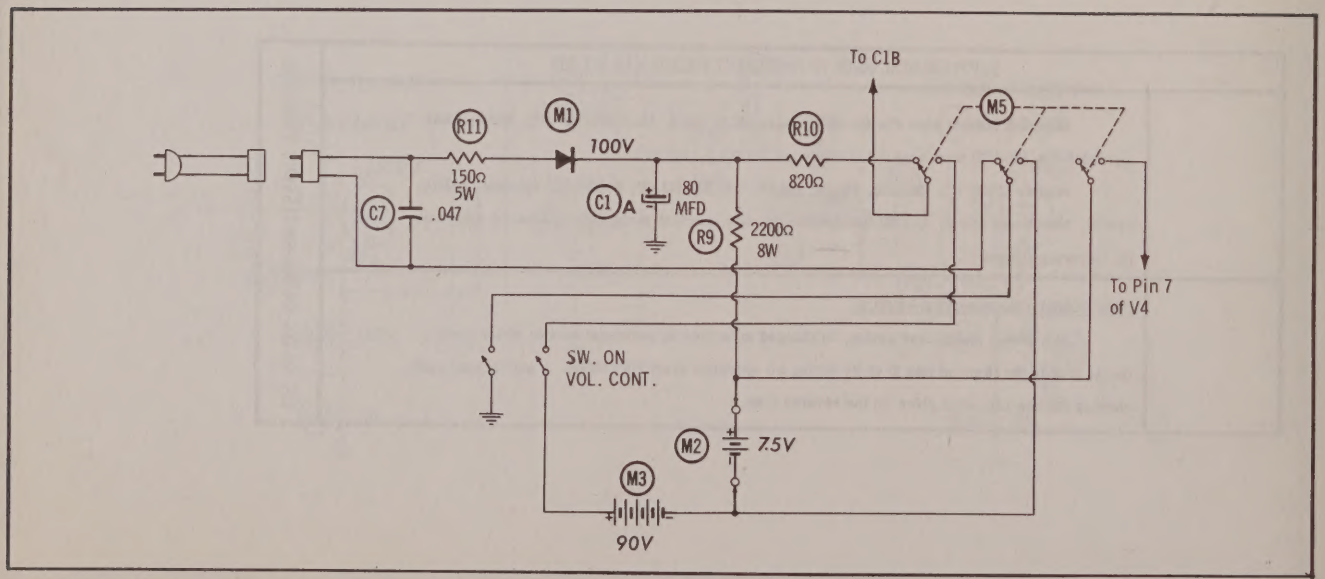
Motorola Models 55B1 (Ch. HS-486), 55L1, 55L2, 55L3, 55L4 (Ch. HS-470), 55M1, 55M2 and 55M3 (Ch. HS-472) were covered in Photofact Folder 6 - Set 303.

Models 55B1U (Ch. HS-508), 55L1U, 55L2U, 55L3U, 55L4U, 55L5U (Ch. HS-509), 55M1U, 55M2U, 55M3U and 55M4U (Ch. HS-510) are electrically identical to the models covered except for the following change.

NEW POWER CHANGEOVER SWITCH

M5, power changeover switch, is changed to include an additional section which opens the A+ lead to the filament (pin 7) of V4 during AC operation (part #1V630598). A partial schematic showing the new circuit is given on the reverse side.


1000mmf
1000 volts
R92
C1
To R91
15Ω
15 Watt
150 mfd
To Junction
C2, L29
M2
1000mmf
1000 volts
M1


To C1B
M1
R11
M5
100V
R10
150Ω
5W
820Ω
C7
.047
C1A
80
MFD
R9
2200Ω
8W
To Pin 7
of V4
SW. ON
VOL. CONT.
M2
7.5V
M3
90V

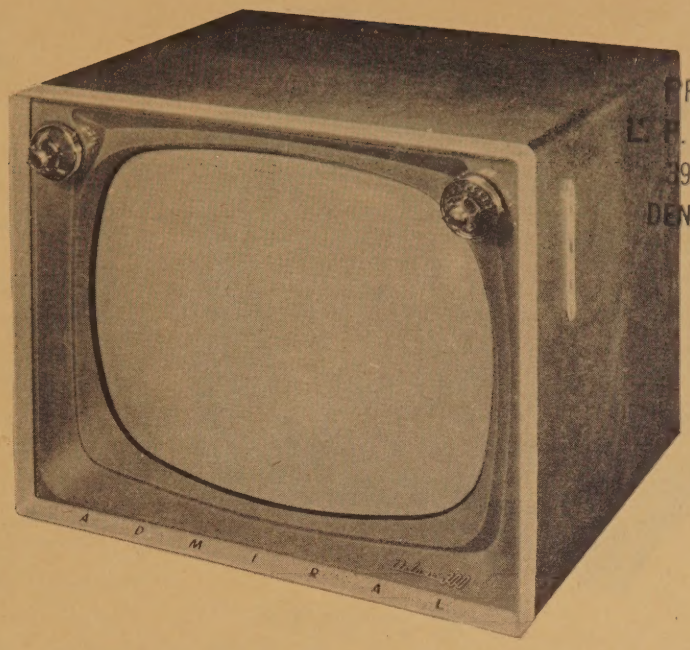
PHOTOFACT* Folder
*TRADE MARK

ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA, 18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . unless it has been purchased as part of a complete volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



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ADMIRAL MODEL T323A1A (Ch. 18Z4PSA)

TRADE NAME	Admiral	MODELS	CHASSIS
		T2306DA, T2307DA	18Y4BSA
		C23A6A, C23A7A	18Y4EFA
		C23A1A, C23A2A, C23A3A, C23A8A	18Y4ESA
		T2301DRA, T2302DRA, T2303DRA	18Y4LSA
		T23E1A, T23E2A, T23E3A	18Y4PSA
		C323A6, C323A7, C323A16, C323A17, C323A19, T323A1, T323A3, T323A3LN	18Z4ES
		C323A6A, C323A7A, C323A16A, C323A17A, C323A19A	18Z4ESA
		(Models unknown)	18Z4ESB
		C325A6, C325A7	18Z4FS
		C325A6A, C325A7A	18Z4FSA
		(Models unknown)	18Z4FSB
		T2302DSA, T2303DSA	18Z4LSA
		T323A1A, T323A2A, T323A2BZA, T323A3A, T323A3LNA	18Z4PSA

MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 175 Watts, 1.4 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)

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Photographs (Con't)
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Schematic (TV) 2
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ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA, 18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA

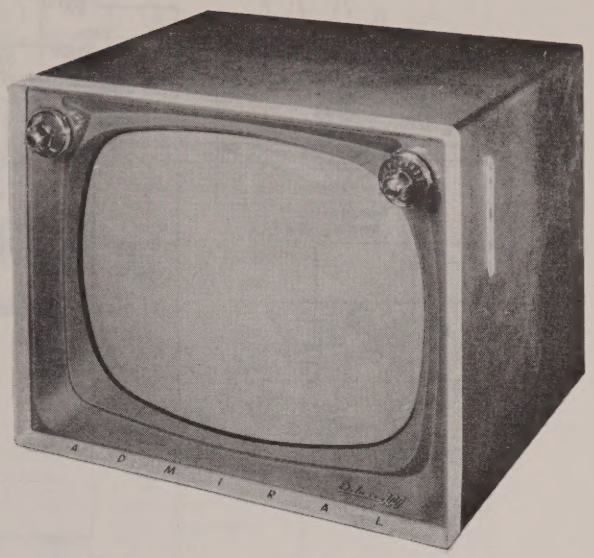
PHOTOFACT* Folder
*TRADE MARK

ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA, 18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from the front.
2. Remove rear cover by prying clips loose.
3. Remove 2 phillips head screws and the escutcheon from the side.
4. Remove 2 metal screws holding the side control panel.
5. Release spring clips and remove the on-off-volume and contrast control.
6. Remove speaker plug, picture tube socket, ion trap, yoke clamp, yoke and HV lead.
7. Remove 4 chassis bolts from the bottom.
8. Remove the chassis.
9. Remove 2 speaker nuts and speaker with audio output transformer attached. NOTE: Some versions may also have the filter choke mounted on the speaker.



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DENVER, COLORADO

MODELS	CHASSIS
T2306DA, T2307DA	18Y4BSA
C23A6A, C23A7A	18Y4EFA
C23A1A, C23A2A, C23A3A, C23A8A	18Y4ESA
T2301DRA, T2302DRA, T2303DRA	18Y4LSA
T23E1A, T23E2A, T23E3A	18Y4PSA
C323A6, C323A7, C323A16, C323A17, C323A19, T323A1, T323A3, T323A3LN	18Z4ES
C323A6A, C323A7A, C323A16A, C323A17A, C323A19A	18Z4ESA
(Models Unknown)	18Z4ESB
C325A6, C325A7	18Z4FS
C325A6A, C325A7A	18Z4FSA
(Models Unknown)	18Z4FSB
T2302DSA, T2303DSA	18Z4LSA
T323A1A, T323A2A, T323A2BZA, T323A3A, T323A3LNA	18Z4PSA

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the centerof its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 knobs from the front of the cabinet.
Remove the metal screws holding the bezel, mask and safety glass from the bottom of the front.
Pull out from bottom to remove the assembly.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 2 or 6 and 10. Readjust the Ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. For location, see tube placement chart.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A10) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA, 18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA

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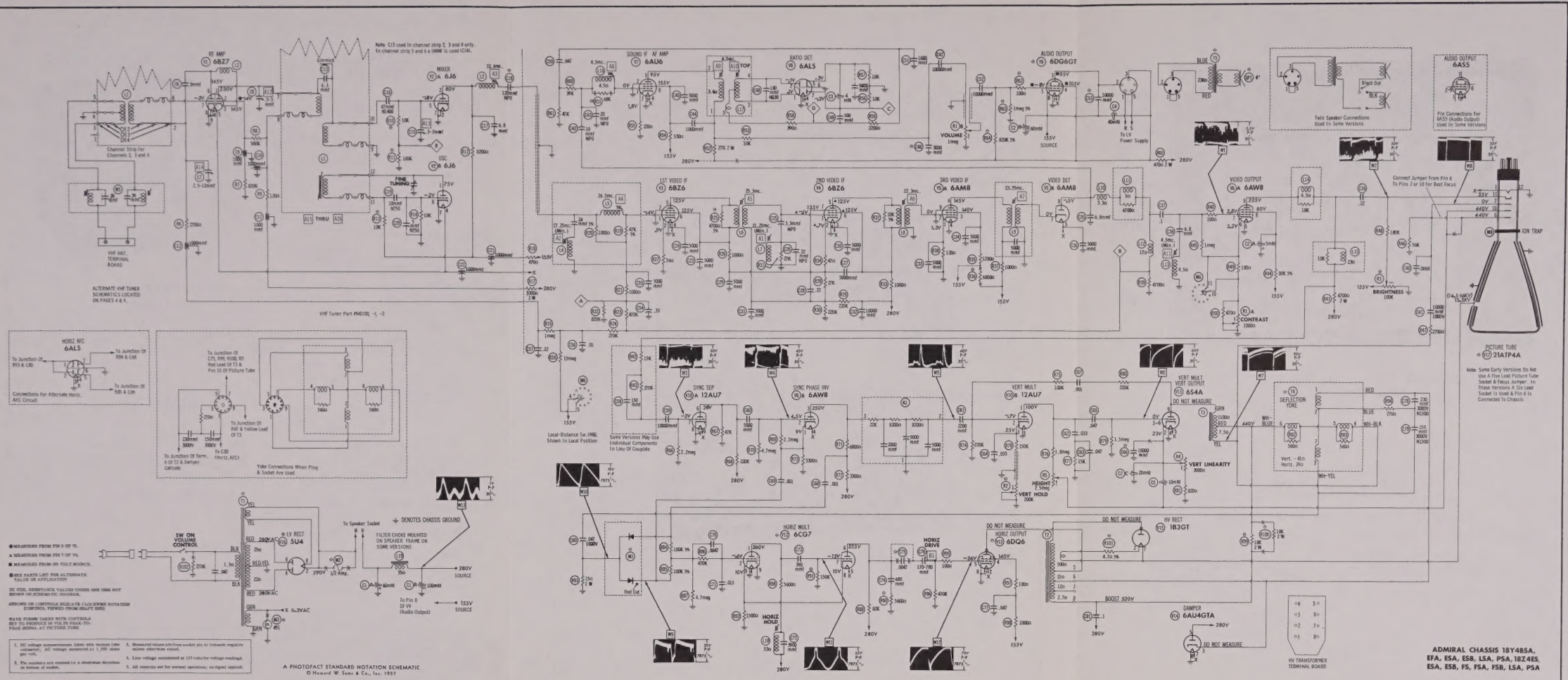
ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA, 18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA
ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA, 18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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VHF Tuner Part #940100, -1, -2
ALTERNATE VHF TUNER SCHEMATICS LOCATED ON PAGES 4 & 9.
Channel Strip For Channels 2, 3 and 4
VHF ANT. TERMINAL BOARD
Note: C13 used in channel strip 2, 3 and 4 only. In channel strip 5 and 6 a 18MMF is used (C14).
RF AMP 6BZ7
MIXER 6J6
OSC 6J6
FINE TUNING
A13 THRU A36
SOUND IF AF AMP 6AU6
RATIO DET 6AL5
AUDIO OUTPUT 6DG6GT
VOLUME 1meg
To LV Power Supply
Twin Speaker Connections Used In Some Versions
AUDIO OUTPUT 6AS5
Pin Connections For 6AS5 (Audio Output) Used In Some Versions
1ST VIDEO IF 6BZ6
2ND VIDEO IF 6BZ6
3RD VIDEO IF 6AM8
VIDEO DET 6AM8
VIDEO OUTPUT 6AW8
Connect Jumper From Pin 6 To Pins 2 or 10 For Best Focus
ION TRAP
BRIGHTNESS 100K
CONTRAST 1000
PICTURE TUBE 21ATP4A
Note: Some Early Versions Do Not Use A Five Lead Picture Tube Socket & Focus Jumper. In These Versions A Six Lead Socket Is Used & Pin 6 Is Connected To Chassis
HORIZ AFC 6AL5
To Junction Of R84 & C88
To Junction Of R85 & C89
Connections For Alternate Horiz. AFC Circuit
To Junction Of C75, R99, R100, R5 Red Lead Of T3 & Pin 10 Of Picture Tube
To Junction Of R40 & Yellow Lead Of T3
To Junction Of Term. 6 Of T2 & Damper Cathode
To CRD (Horiz. AFC)
Yoke Connections When Plug & Socket Are Used
SYNC SEP 12AU7
SYNC PHASE INV 6AW8
Local-Distance Sw. (MD) Shown In Local Position
Some Versions May Use Individual Components In Lieu Of Coupler
VERT MULT 12AU7
VERT MULT 12AU7
VERT OUTPUT 654A
DO NOT MEASURE
VERT LINEARITY 3000Ω
HEIGHT 5meg
VERT HOLD 200K
DEFLECTION YOKE
Vert. - 41Ω Horiz. 2Ω
HORIZ MULT 6CG7
HORIZ HOLD 5meg
HORIZ DRIVE
HORIZ OUTPUT 6DQ6
DO NOT MEASURE
HV RECT 1B3GT
BOOST 520V
DAMPER 6AU4GTA
DO NOT MEASURE
HV TRANSFORMER TERMINAL BOARD
SW ON VOLUME CONTROL
LV RECT 5U4
To Speaker Socket
FILTER CHOKE MOUNTED ON SPEAKER FRAME ON SOME VERSIONS
DENOTES CHASSIS GROUND
280V SOURCE
155V SOURCE
To Pin 8 Of V9 (Audio Output)
X 6.3VAC
◆MEASURED FROM PIN 5 OF T1.
▲ MEASURED FROM PIN 7 OF T1.
■ MEASURED FROM 155 VOLT SOURCE.
●SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 90 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 cycles per second.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to ground unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

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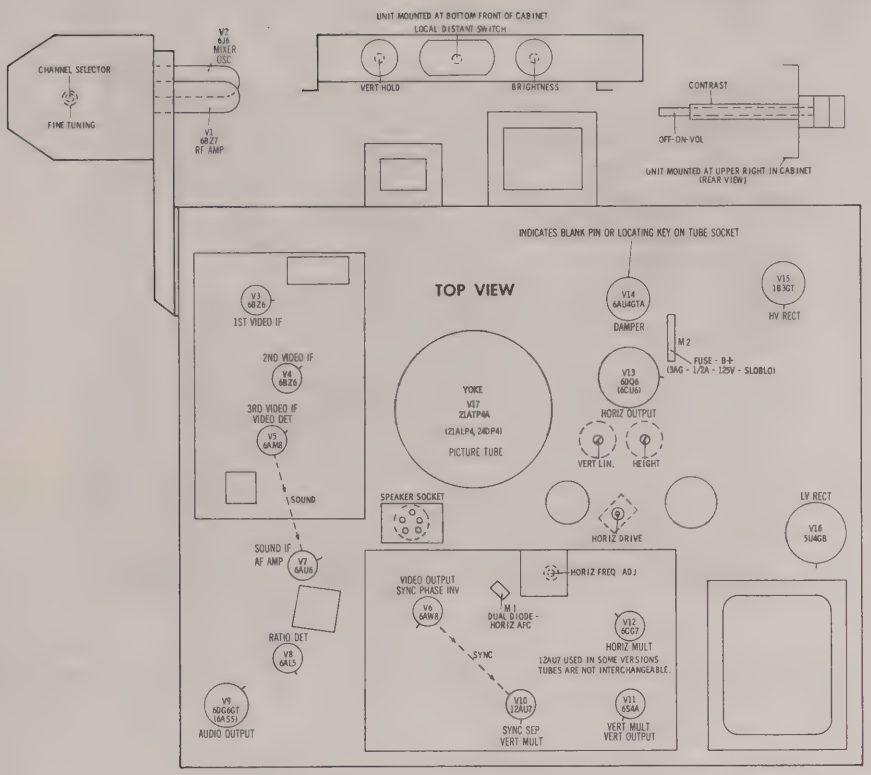
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

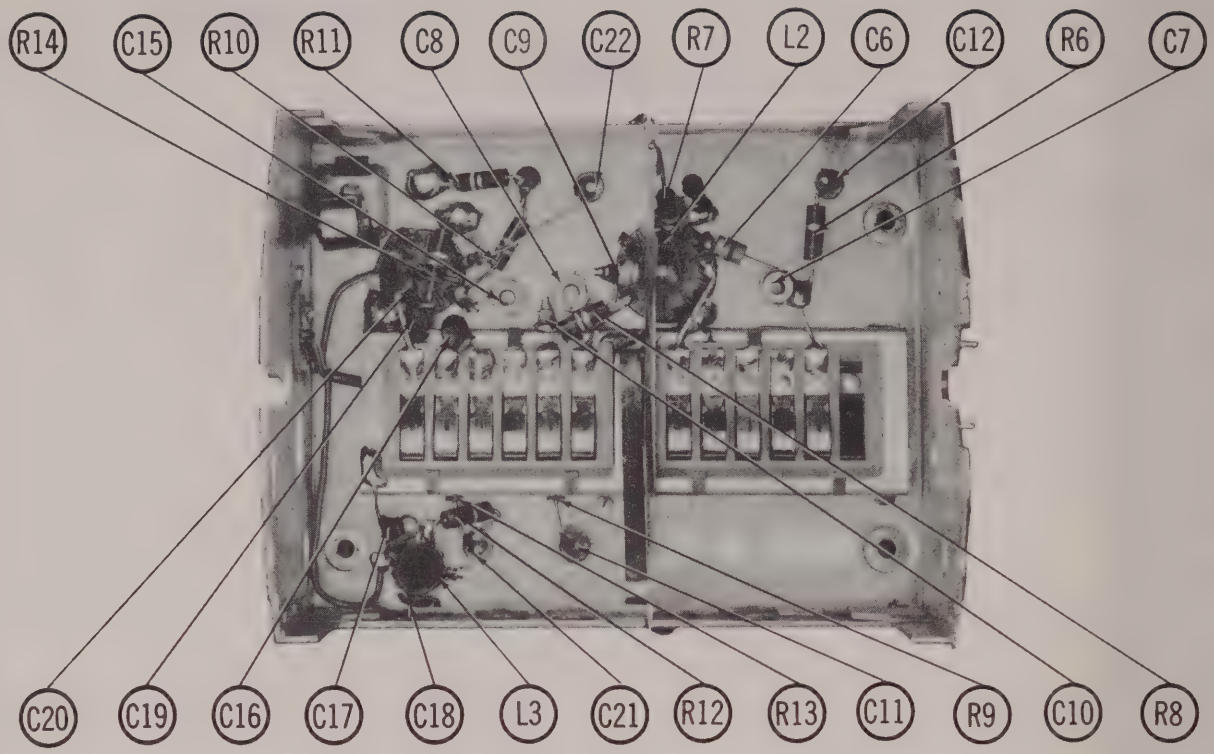
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M2), V16**

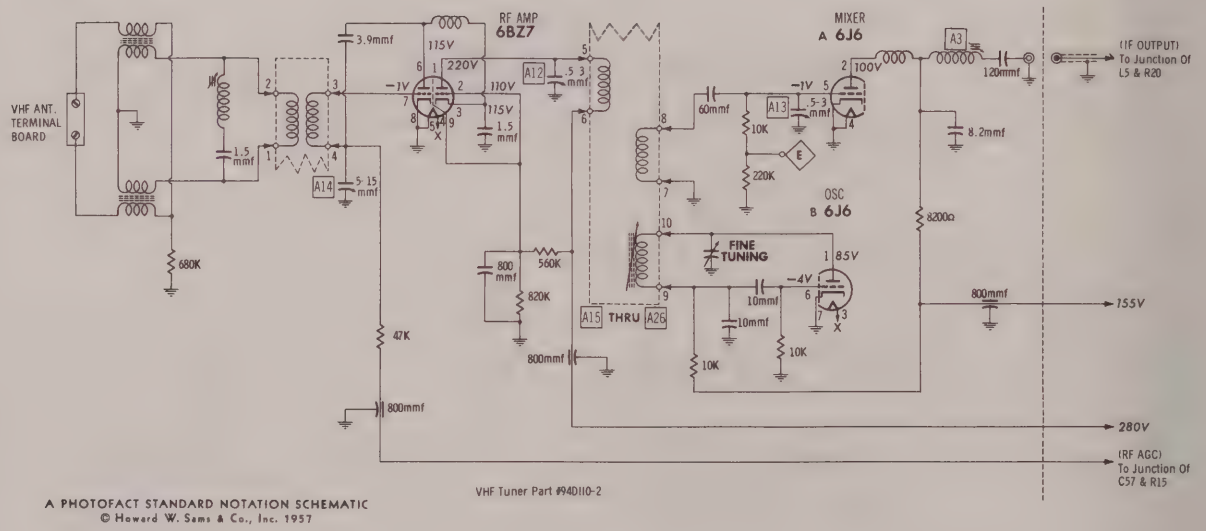
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V9**
No pic, no sound, has snow - **V1, V2, V3, V9**
No pic, has sound, has raster - **V6, V17, V9**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V10, V6**
No horiz. sync - **V10, V6, Diode (M1)**
No vert. or horiz. sync - **V10, V6**

SWEEP FAILURE
No raster, has sound - **M1, V12, V13, V14, V15, V17, V9**
No vertical deflection - **V10, V11**
Poor vert. linearity or foldover - **V10, V11**
Poor horiz. linearity or foldover - **V12, V13, V14, V9**
Narrow picture - **V12, V13, V14, V9, V16**
Vert. off freq. - **V10, V11**
Horiz. off freq. - **V12**



RF TUNER BOTTOM VIEW



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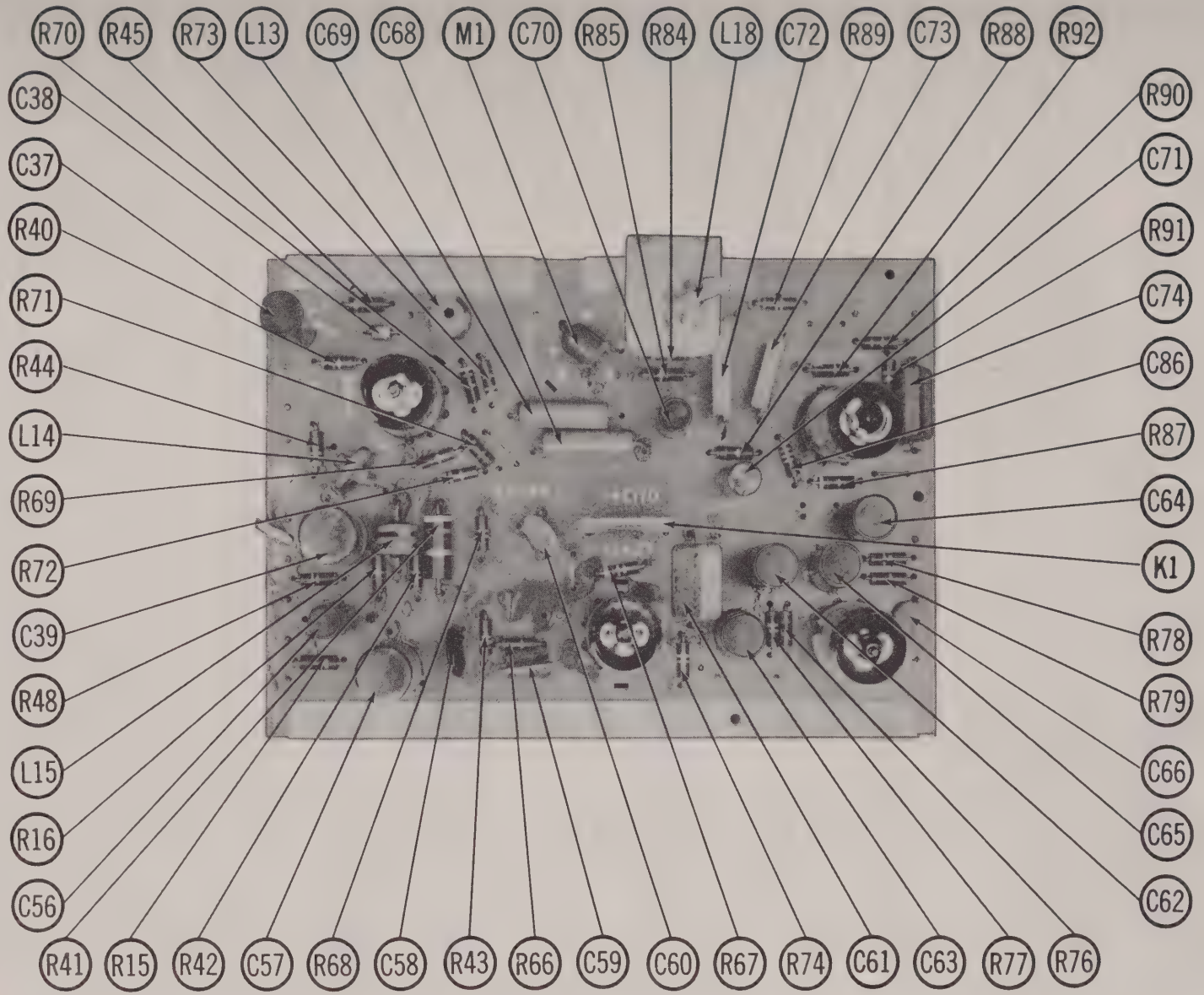
VHF Tuner Part #94D110-2

ALTERNATE VHF TUNER SCHEMATIC



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DENVER, COLORADO

SYNC & SWEEP PRINTED BOARD

ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA,
18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Remove the mixer-osc. tube (V2) from its socket and replace with a 6J6 having pin 1 removed.
Disconnect antenna leads and connect a short jumper across the antenna terminals.
Turn the contrast control fully counter clockwise.
Connect the negative lead of a 3 volts bias supply to point Ⓐ. Positive to chassis.
For steps 1 and 2 use a strong signal from the generator but for all other steps, Use only enough generator output to provide usable indication on VTVM. Use lowest scale on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy mixer-osc. tube. Low side to chassis.	21.25MC (Unmod)	Any non-interfering channel	DC probe thru decoupling network (Fig. 1) to point Ⓑ. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	27.25MC	"	"	A2	"
3.	"	"	22.6MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	26.5MC	"	"	A4	"
5.	"	"	25.3MC	"	"	A5	"
6.	"	"	22.3MC	"	"	A6	"
7.	"	"	23.75MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to ungrounded tube shield floating over dummy mixer-osc. tube. Low side to chassis.	23.0MC (10MC Swp)	21.25MC 22.0MC 23.0MC 25.0MC 25.75MC	Any non-interfering channel	Vert. Amp. thru decoupling network (Fig. 1) to point Ⓑ. Low side to chassis.		Check for response similar to Fig. 2. If necessary, retouch A1 thru A7 to obtain desired response. Adjust A4 and A5 for position of 25.75MC marker and amplitude of response curve on high frequency side. Adjust A3 and A6 for position of 22MC and 23MC markers and amplitude of response curve on low frequency side.

SOUND IF ALIGNMENT

Disconnect antenna and connect a short jumper across antenna terminals.
Set contrast control fully counter clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 8 (plate) of 6AM8 (V3). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓒ. Common to chassis.	A8, A9	Use only enough generator output to provide usable indication on VTVM.
10.	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to pin 8 (plate) of 6AM8 (V5). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓒ. Common to chassis.	A11	Connect a very short jumper across L11. Use lowest scale on VTVM. Adjust for MINIMUM deflection.

4.5MC TRAP ALIGNMENT USING ON THE AIR SIGNAL

Tune in a strong station and adjust the fine tuning until a beat pattern appears in the picture. Adjust A11 for MINIMUM beat pattern while observing the picture.

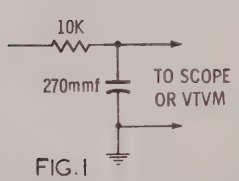


FIG.1

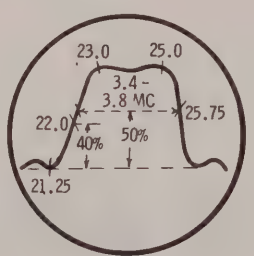


FIG.2

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Connect bias as under "Video IF Alignment".
Allow a 20 minute warm-up period for the receiver and test equipment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (E). Low side to chassis.	A12, A13	Adjust for response curve similar to Fig. 3 with markers above 90%.
13.	"	"	85MC (10MC Swp)	83.25MC 97.75MC	6	"	A14	Adjust for response curve similar to Fig. 3. Adjust for maximum amplitude and flat-topped appearance with markers properly positioned.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 3. If markers fall below 70% on any high band channel, make compromise adjustment of A12 and A10 with channel switch set to that channel. If markers fall below 70% on any low band channel, make compromise adjustment of A14 with channel selector set to that channel. Check all other channels to see that they have not been seriously affected.
			207MC (10MC Swp)	205.25MC 209.75MC	12			
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT FOR TUNERS #94D100, -1, -2 & 94D110-2

Connect bias as under "Video IF Alignment".
Allow a 20 minute warm-up period for the receiver and test equipment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should ber terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (E). Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A16	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A17	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A18	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A19	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A20	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A21	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A22	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A23	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A24	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A25	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A26	

OSCILLATOR ALIGNMENT FOR TUNER #94E142-1

1. Turn the set on and allow 15 to 20 minute warm-up.
2. Set channel selector to the lowest channel operating in the area.
3. Set the fine tuning control to the center of its range.
4. Set other controls for normal picture and sound.
5. Remove channel selector, fine tuning knob and gold retainer disk, under the knobs, if used.
6. Using a 1/8" blade, non-metallic tool carefully adjust the channel slug for best picture and sound. (NOTE: This may not be point at which the sound is loudest). If two slugs are visable at the front of the tuner, adjust the top one. Repeat this procedure for the remaining stations, adjusting them in order of the channel number from the lowest to the highest.

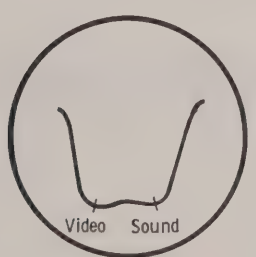


FIG. 3

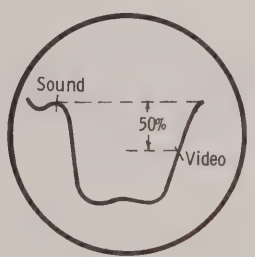
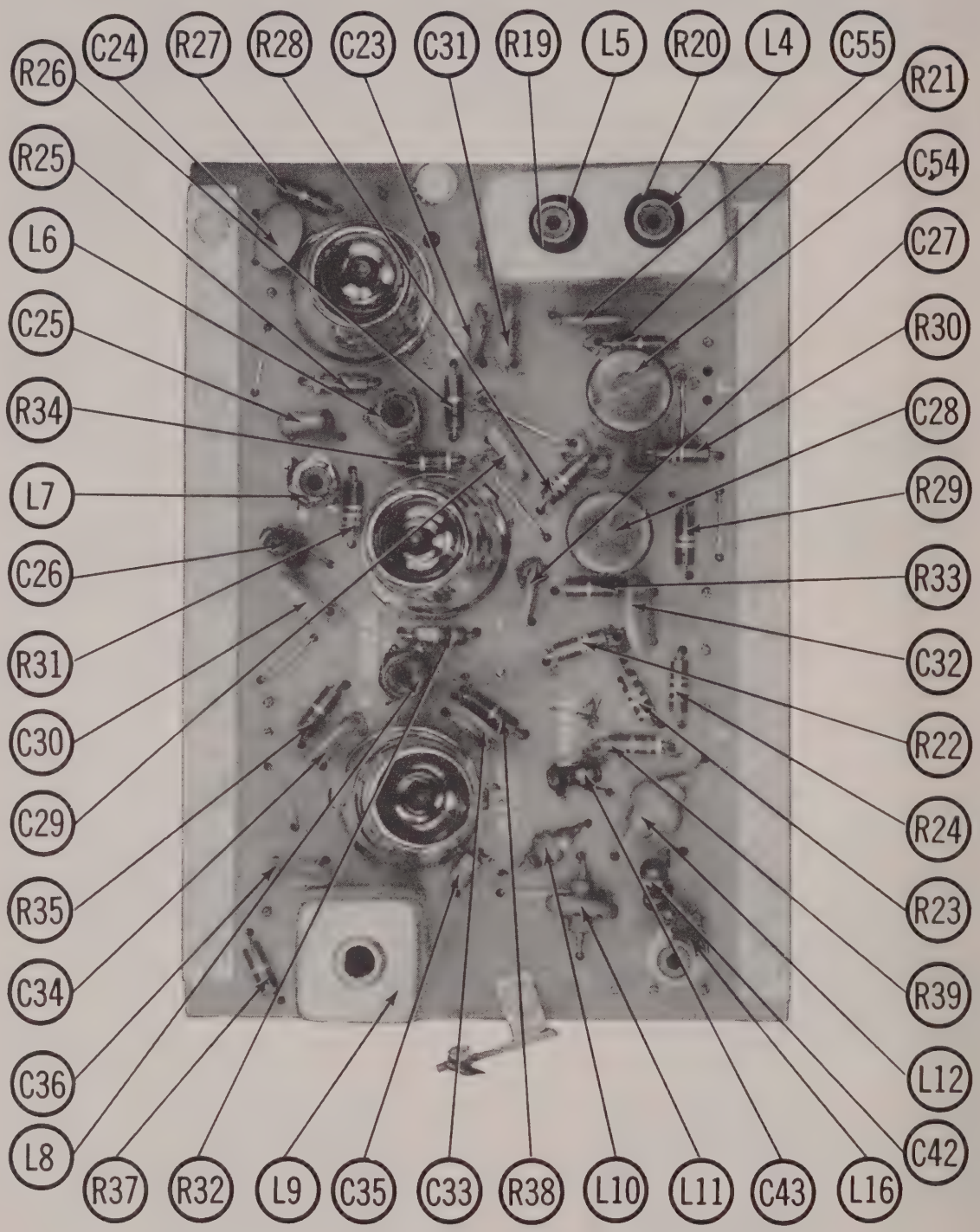
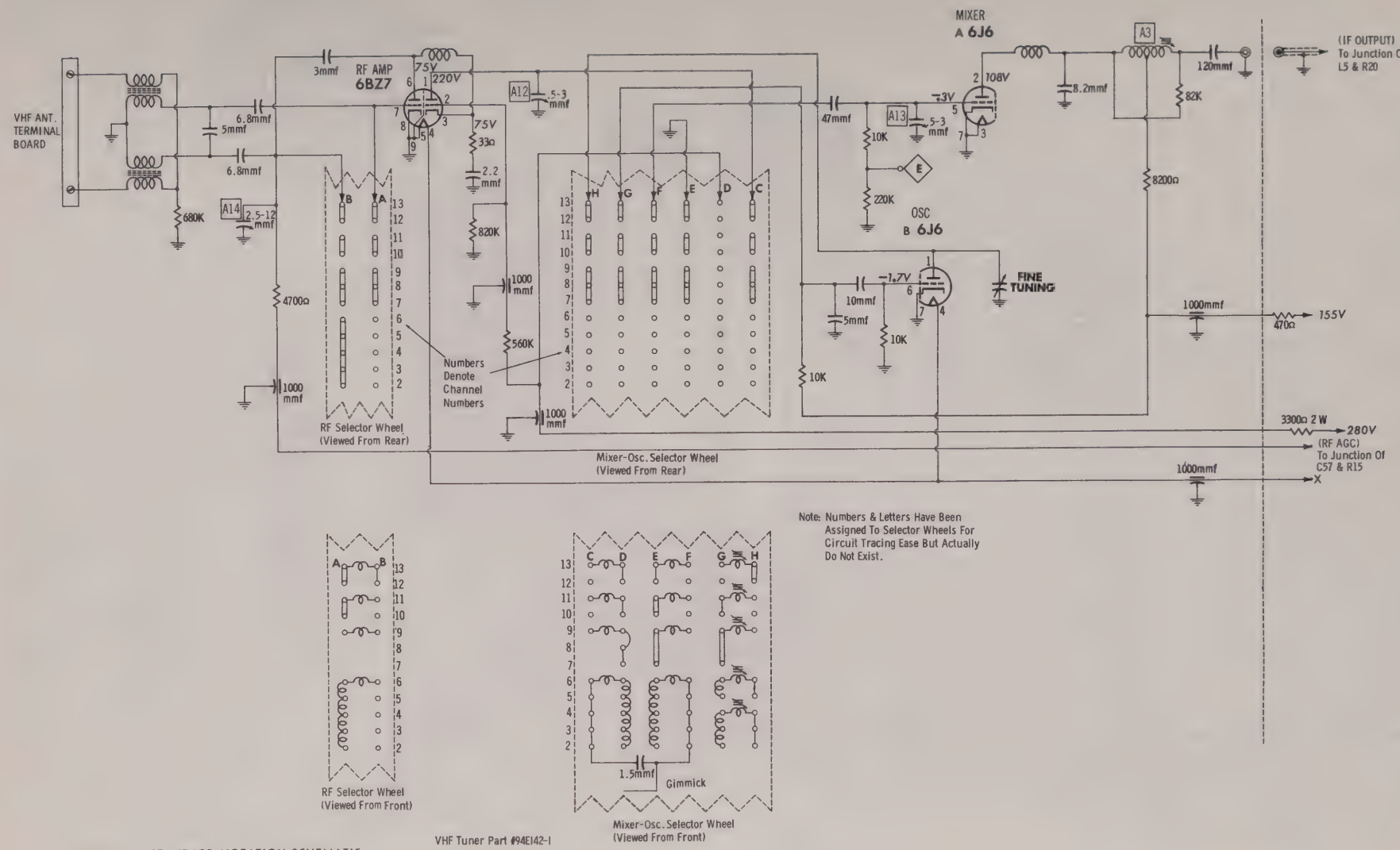


FIG. 4



VIDEO IF PRINTED BOARD


VHF ANT. TERMINAL BOARD
RF AMP 6BZ7
MIXER A 6J6
OSC B 6J6
(IF OUTPUT) To Junction Of L5 & R20
FINE TUNING
155V
280V
(RF AGC) To Junction Of C57 & R15
Numbers Denote Channel Numbers
RF Selector Wheel (Viewed From Rear)
Mixer-Osc. Selector Wheel (Viewed From Rear)
RF Selector Wheel (Viewed From Front)
Mixer-Osc. Selector Wheel (Viewed From Front)
Gimmick
Note: Numbers & Letters Have Been Assigned To Selector Wheels For Circuit Tracing Ease But Actually Do Not Exist.

VHF Tuner Part #94E142-1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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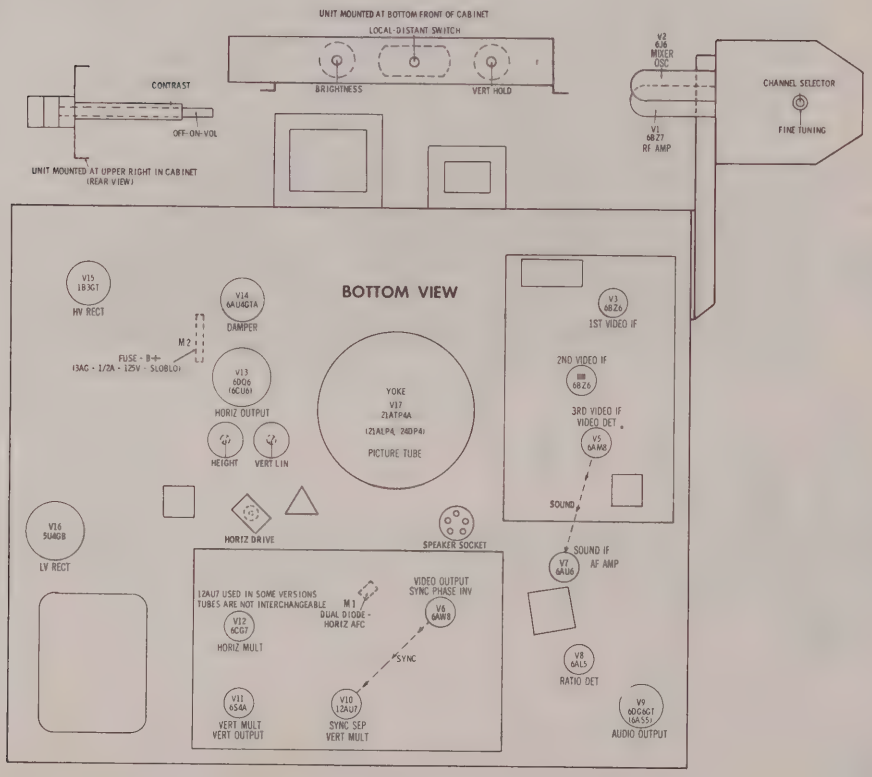
ALTERNATE VHF TUNER SCHEMATIC

ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA, 18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA

RESISTANCE MEASUREMENTS

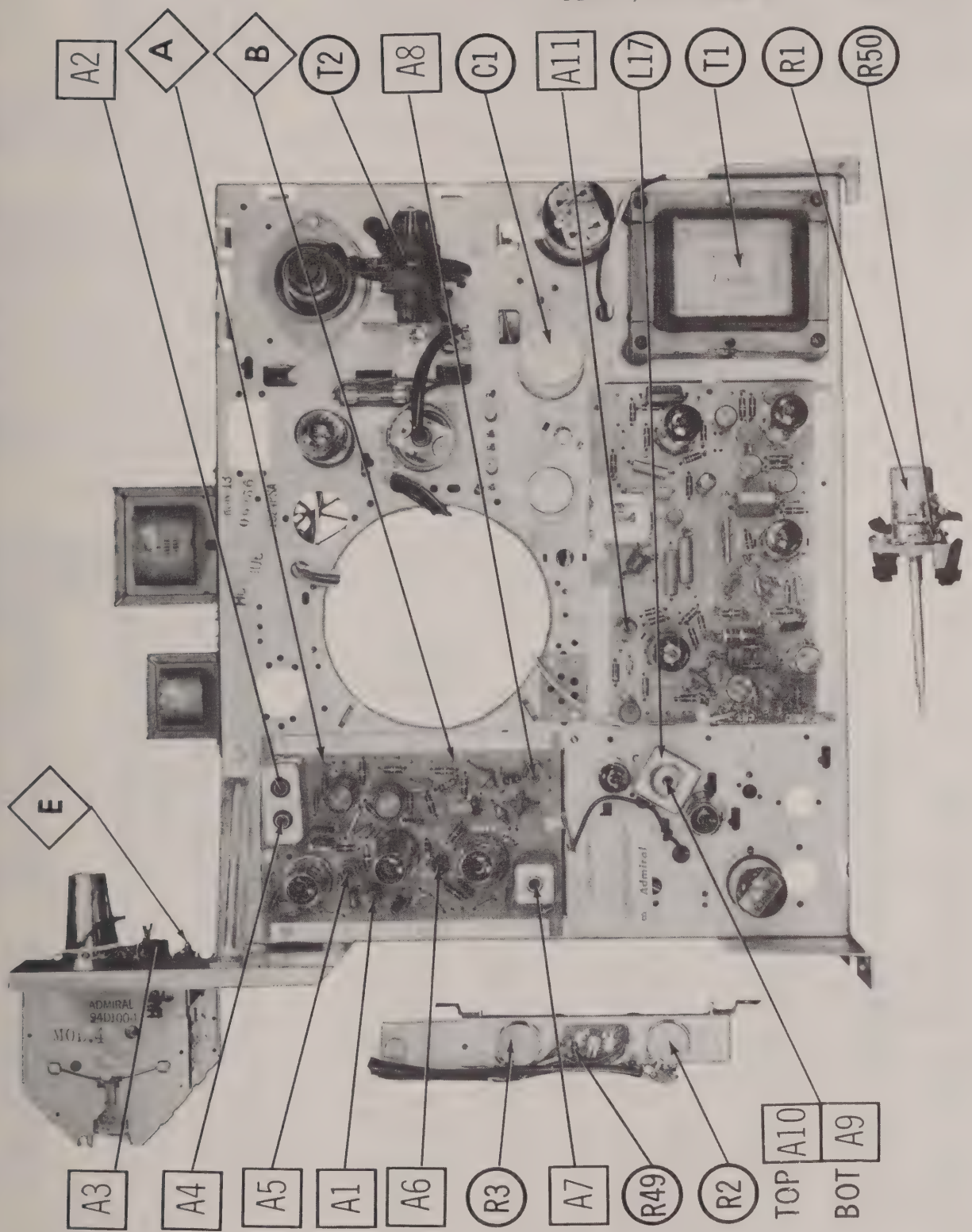
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ7	† 3500Ω	280K	INF	0Ω	.1Ω	INF	1.2Meg	0Ω	0Ω
V2	6J6	■ 10K	■ 8600Ω	0Ω	.1Ω	110K	10K	0Ω		
V3	6BZ6	280K	56Ω	0Ω	.1Ω	▲ 1000Ω	▲ 1000Ω	0Ω		
V4	6BZ6	† 100K	▲ 47Ω	.1Ω	0Ω	† 1000Ω	† 1000Ω	† 120K		
V5	6AM8	120Ω	.4Ω	■ 8000Ω	0Ω	.1Ω	■ 1000Ω	.3Ω	4200Ω	0Ω
V6	6AW8	3200Ω	1.4Meg	† 10K	.1Ω	0Ω	• 450Ω	1Meg	■ 30K	† 4700Ω
V7	6AU6	85K	0Ω	0Ω	.1Ω	† 27K	■ 330Ω	220Ω		
V8	6AL5	INF	INF	0Ω	.1Ω	10K	0Ω	10K		
V9	6DG6GT	NC	.1Ω	† 750Ω	† 525Ω	1Meg	TP	0Ω	¶	
V10	12AU7	‡ 3Meg	220K	• 200K	0Ω	0Ω	† 60K	2.2Meg	0Ω	.1Ω
V11	6S4A	NC	• 1500Ω	1.5Meg	0Ω	.1Ω	1.5Meg	NC	NC	‡ 10K
V12	6CG7	† 5700Ω	550K	1500Ω	0Ω	.1Ω	† 82K	150K	1500Ω	0Ω
V13	6DQ6	TP	.1Ω	TP	■ 1100Ω	470K	TP	0Ω	0Ω	TOP CAP ‡ 15Ω
V14	6AU4GTA	NC	NC	¶	NC	† 55Ω	NC	.1Ω	0Ω	
V15	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡ 515Ω
V16	5U4GB	NC	¶	NC	27Ω	NC	25Ω	NC	¶	
V17	21ATP4A	.1Ω	56K	Pin 6 ‡ 9000Ω	Pin 10 ‡ 9000Ω	Pin 11 • 190K	Pin 12 0Ω			

† MEASURED FROM PIN 2 OF V16.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION
‡ MEASURED FROM PIN 3 OF V14.
■ MEASURED FROM PIN 8 OF V9.
▲ MEASURED FROM PIN 7 OF V4.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS TOP VIEW

ADMIRAL CHASSIS 18Y4BSA, EFA, ESA, ESB, LSA, PSA,
18Z4ES, ESA, ESB, FS, FSA, FSB, LSA, PSA

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp.	6BZ7	
V2	Mixer-Osc.	6J8	
V3	1st Video IF Amp.	6BZ6	
V4	2nd Video IF Amp.	6BZ6	
V5	3rd Video IF Amp. - Video Det.	6AM8	
V6	Video Output, Sync Phase Inv.	6AW8	
V7	Sound IF Amp. -AF Amp.	6AU8	Note 4

ITEM No	USE	TYPE	NOTES
V8	Ratio Det.	6AL5	
V9	Audio Output	8DQ8GT	Note 1
V10	Sync Sep. -Vert. Mult.	12AU7	
V11	Vert. Mult. -Vert. Output	6BA	
V12	Horiz. Mult.	6CG7	Note 3
V13	Horiz. Output	6DQ6	
V14	Damper	1A3/6AU4	
V15	HV Rectifier	1B3GT	
V16	I.V Rectifier	5U4GB	Note 4

Note 1: Some versions may use a 6A5 in this application.
Note 2. Some versions may use a 12AU7 in this application.
NOTE- These tubes are NOT INTERCHANGEABLE.

Note 3 : Some versions may use a 6CU6 in this application.
Note 4:Some versions may use a 5U4GA in this application.

PICTURE TUBE

ITEM No	REPLACEMENT DATA: ADMIRAL PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V17	21ATP4A	21ATP4 ①	21ATP4A/21ATP4 ②	21ATP4A / 21ATP4 / 21ATP4A ③	① Silver Screen "SS" ② Aluminized
	21ALP4	21ALP4	21ALP4A	21ALP4A	
	21ALP4A	21ALP4A ③	21ALP4B/21ALP4 A ③	21ALP4A/ 21ALP4B ③	
	21ALP4B ③				
	24DP4	24DP4A ③	24DP4	24DP4 / 24DP4A ③	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	TYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	480	350	67C15-10	AFH3-10-25	DO044	FP330-9	TMD-89	D-177 MT-4530	TVL-3619
B	400	350						C-505 MTD-3530	
C1A	40	350	67D15-100	AFH3-04-50	CD838	FPET. 8 TC50X			
B	480	300							
C	20	50							
C3	8	50	67B37-3	PRS150V4	BBR4-50	TC30	TD-4-50	MT-0504	TVA-1402
C4	40	300	67A1-32	PRS250V40	BR402S	TC68	TD-40-250	FM-2540	TVA-1511
C5	10	500	67A1-22	PRS500V10	BR180	TC52	TD-10-500	MT-5100	TVA-1903

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	3		53B38-050	NPO-81 3		C19Y3C	TCO-3	ZT-553		
C7	2.5-12		56A38-5				511S-D	CT565A	503C-DI	
C8	3-3		56A38-6						503C-DI	
C9	1000		53B38-6	EF-001		MFT-1000			503C-DI	
C10	1000		53B36-1	EF-001		MFT-1000			503C-DI	
C11	1000		53B28-5	EF-001		MFT-1000			503C-DI	
C12	1000		53B28-5	EF-001		MFT-1000			503C-DI	
C13	1.3		53B38-023	NPO-81 1.0		TCZ-1	TCO-1		STCCB-V1	
C14	1.0			NPO-81 1.0		TCZ-1	TCO-1		STCCB-V1	
C15	5-3		56A38-4				511S-D	CT565A		
C16	47		53C10-73							N1500
C17	6.8		53C10-35	NPO-81 6.8	TCZ-5S8	C10Y6SC	TCO-6.8	ZT-5568	STCCB-V6S	
C18	130			NPO-81 130	TCZ-130	C10Q3C	TCO-130		STCC-T12	Note 1 NPO
C19	10		53C10-50	NT50-81 10	TCN-10	C10Q1J	TCT-10	NT-541	STCCU-Q1	NT50
C20	5		65D10-52	NT50-81 5	TCN-5	C10Y5U	TCT-5	NT-555	STCCB-V5	
C21	1000		53B38-5	EF-001	MFT-1000				503C-DI	
C22	1000		53B38-6	EF-001	MFT-1000				503C-DI	
C23	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C24	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C25	8	3	65C8-89	NPO-81 3 .3	TCZ-3R3	C10Y3C	TCO- 3 .3	ZT-5533	STCCB-V3S	NPO
C26	33		53C10-113	NPO-81 33	TCZ-33	C10Q3EC	TCO-33		STCC-Q3S	NPO
C27	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C28	.22	600	64A10-51	P488M-22		BCR22J		ACE622	4SE-P22	
C29	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C30	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C31	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C32	10000		65C43-3	BPD-01	DD-103	BYA6S	ED-01	DC511	5HK-S1	
C33	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C34	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C35	8.8		65B28-068	NPO-81 8.8	TCZ-8R8	C10Y8SC	TCO-8.8	ZT-5568	STCCB-V8S	
C36	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C37	.1	300	64B16-52	P388M-1		DCR15J		ACE401	4SE-P10	
C38	.22	600	64B38-066	NPO-81 8.8	TCZ-8R8	C10Y8SC	TCO-8.8	ZT-5568	STCCB-V8S	
C39	40	400	64B10-1	P488M-32		BCR32J		ACE622	4SE-P32	
C40	.0068	600	64B3-16	P488M-0068	DS-682	CUB6D68	GP-6800	GEM-6268	5TM-D68	
C41	10000	1000	65A2-13							Note 9
C42	10		65C8-64	NPO-81 10	TCZ-10	C10Q3C	TCO-10	ZT-541	STCC-Q3	NPO
C43	30		65C8-51	NPO-81 30	TCZ-30	C10Q3C	TCO-30	ZT-5421	STCC-Q3	NPO
C44	1000		65C39-1	BPD-001	DD-102	BYA6C	ED-02	DC511	5HK-D4	
C45	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C46	5000			BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C47	10000			BPD-01	DD-103	BYA6S	ED-01	DC511	5HK-S1	N1500
C48	180		53D10-53							
C49	500		65C39-3	BPD-0005	DD-501	L10T6	ED-500	UC-535	5GA-T9	
C50	.047	400	64B16-55	BPD-05	DD-503	CUD4S47		GEM-4147	47M-S47	
C51	1000		64B16-43	BPD-001	DD-103	BYA6D	ED-001	DC511	5HK-D3	
C52	10000		65C43-3	BPD-01	DD-103	BYA6S	ED-01	DC511	5HK-S1	
C53	10000			BPD-01	DD-103	BYA6S	ED-01	DC511	5HK-S1	Note 3
C54	.33	300	64B15-50	P388M-33		DCR33J			3SE-P33	
C55	5000		65C43-1	BPD-005	DD-502	BYA10D6	ED-005	DC525	5HK-D5	
C56	.01	400	64B18-59	BPD-01	DD-103	BC68J	ED-01	ACE611	4SE-S10	
C57	.22	200	64B16-51	P388M-22		BCR22J		ACE622	3SE-P22	
C58	150			BPD-00005	DD-151	L07T5	ED-150	UC-5315	5GA-T15	
C59	10000		65C43-3	BPD-01	DD-103	BYA6S	ED-01	DC511	5HK-S1	
C60	5000		65B20-5	BPD-005	DD-503	BYA10D6	ED-005	DC525	5HK-D5	
C61	2200		65B21-223	1484-0022		1R5D22	ED-0022		M3-222	
C62	.033	600	64B15-10	BPD-03	DF-303	BC683J			6SE-S33	
C63	.047	400	64B16-53	BPD-05	DF-503	BC684J		ACE647	4SE-S47	
C64	.033	600	64B16-56	BPD-03	DF-303	BC683J			6SE-S33	
C65	.047	400	64B16-9	BPD-05	DF-503	BC684J		ACE647	4SE-S47	
C66	10000		65C43-3	BPD-01	DD-103	BYA6S	ED-01	DC511	5HK-S1	Note 3
C67	.001	1600	64A2-1	1858N-001		CUR1D1		GEM-1S1	1TM-D1	
C68	.001	400	64B21-1	BPD-001	DE-102	CUB4D1	ED-001	GEM-4J1	4TM-D1	
C69	.001	400	64B21-1	BPD-001	DE-102	CUB4D1	ED-001	GEM-4J1	4TM-D1	

TRANSFORMER (POWER)

ITEM No	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117VAC @1.4A	560VCT @.230A	5V @ 3A	6.3V @6.3A	60C35-1 ①				26R90 ③	R-65BC
					60C35-1 ②	P9738 ③	P-3055 ③	P-8167 ③	26R90 ③	R-65DC

① Used in chassis 18Z4PSA, 18Z4ESA, 18Z4ES, 18Z4FS, 18Z4FSA, 18Z4LSA.
② Used in chassis 18Y4SBA, 18Y4ESA, 18Y4EFA, 18Y4PSA, 18Y4LSA.
③ Parallel & phase 6.3V fil. windings. Tape 12. 6VCT fil. winding. Drill new mtg. holes.
④ Tape 6.3V, 4.4A fil. winding.
⑤ Parallel & phase 6.3V fil. windings. Drill new mtg. holes.
⑥ Parallel & phase 6.3V fil. windings.
⑦ Parallel & phase 6.3V, 6A fil. windings. Tape 6.3V, 1.2A fil. winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	RCA PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T2	Horiz. Output Trans.	79D05-1	PB420* ①	31V0-54*1			X129 *①	A-82G*	D-49 *5
T3	Vert. Output Trans.	79D43-4	21S07 ①	A 2824 ①			V31J	A-81G	A-19X
T4A	Yoke(90°)Horiz. (18.5MH)	94D67-1 ②	D5807 ①	94DF-91 ①	235D1 ①		DY-18A ①	DY-18A ①	Y-6A
	Vert. (38MH)	94D67-2 ②							Y-6B
		19AU2-3 ②							
		94D67-8 ③							

① Drill new mounting hole(s).
② Cut and tape yellow lead.
③ Includes resistors R82 and R83.
④ Rear cover and centering device.
⑤ Yoke Clamp.
⑥ Alternate yoke used in Ch. 18Y4SBA, 18Y4ESA, 18Y4EFA, 18Y4PSA and 18Y4LSA (Run 14 thru 19).
⑦ Includes resistors R82, R83 and yoke plug (Part #88A18-5).
⑧ Use original horizontal damping network.
⑨ Loosen and rotate core clamp 180°. Connect same as original.
⑩ Use original rear cover and centering device.
* This part may be superceded by Parts Manufacturer's introduction of special unit in this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5	5	5	4	5	
6	2	4	6	3	6		
8	1	1	1	8	1	2	
Special Notes	⑪	⑪	⑪	⑪	⑪	⑪	

⑪ Filament winding requires two turns.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC	REPLACEMENT DATA: ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	2500Ω	3-4Ω	79D66-1 ① 79D66-2 ② 79D66-3 ③	21U03 ③	2-3228 ③	A-3876 ③	22345 ③	8-1X ④	① Used with speaker part #78D11-4. ② Used with speaker part no's. 78D19-3 & 78B05-1. ③ Used with speaker part #78D18-1. ④ Bend ears down. ⑤ Tape lug on primary winding.

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V C IMP	REPLACEMENT DATA: ADMIRAL PART No.	QUAM PART No.	NOTES
SP1 ①	6"	PM	3-4Ω	78D11-4 ①	6A1	
	6"	PM	3-4Ω	78D19-2 ②	6A2i	
	4"	PM	3-4Ω	78B05-1 ③	4A07	
	8"	PM		78D18-1 ④		
	8"	PM		78D18-2 ③		

① Includes speaker plug & audio output trans. Used in all versions of chassis 18Z4PSA & some versions of chassis 18Z4ES, 18Z4FS, 18Z4ESA, 18Z4FSA, 18Z4LSA.
② Includes speaker plug & audio output trans. Used in all versions of chassis 18Z4ESA & some versions of chassis 18Z4ES, 18Z4FS, 18Z4PSA, 18Z4ESB, 18Z4FSB.
③ Includes speaker plug & audio output trans. Used in all versions of chassis 18Z4LSA & some versions of chassis 18Z4ESB, 18Z4FSB.
④ Includes speaker plug & audio output trans. Used in some versions of chassis 18Z4PSA, 18Z4ESA, 18Z4ES, 18Z4FS, 18Z4FSA, 18Z4LSA, 18Z4ESB, 18Z4FSB.
⑤ Used in some versions of chassis 18Z4PSA, 18Z4ESA, 18Z4ES, 18Z4FS, 18Z4FSA, 18Z4LSA, 18Z4ESB, 18Z4FSB.
⑥ In chassis 18Y4SBA, 18Y4ESA, 18Y4EFA, 18Y4PSA, 18Y4LSA check part # stamped on the speaker; these part numbers include L18, speaker plug & audio output transformer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R8	2700Ω			BTS-2700	
R7	680K			BTS-680K	
R8	560K			BTS-560K	
R9	180Ω			BTS-180	
R10	10K			BTS-10K	Note 1
R11	100K			BTS-100K	Note 3
R12	8200Ω			BTS-8200	
R13	10K			BTS-10K	Note 3
R14	10K			BTS-10K	
R15	1Meg				
R16	15Meg				
R17	3300Ω	2		BTS-3300	
R18	470Ω			BTS-470	
R19	47K 5%				
R20	100Ω				
R21	1000Ω			BTS-1000	
R22	680K			BTS-680K	
R23	470K				
R24	270K				
R25	270Ω 5%				Note 4
R26	1.000Ω			BTS-1000	
R27	56Ω			BTS-56	
R28	27K			BTS-27K	
R29	220K			BTS-220K	
R30	330K				
R31	27K				
R32	10K 5%				
R33	1000Ω			BTS-1000	
R34	47Ω			BTS-47	
R35	1800Ω			BTS-1200	
R36	6800Ω			BTS-6800	Note 3
R37	1000Ω				
R38	120Ω			BTS-120	
R39	4700Ω			BTS-4700	
R40	100Ω			BTS-100	
R41	4700Ω	2		BTS-4700	
R42	15K			BTS-15K	
R43	270K			BTS-270K	
R44	30K 5%			BTS-30K 5%	
R45	1Meg			BTS-1Meg	
R46	56K			BTS-56K	
R47	2700Ω			BTS-2700	
R48	180K			BTS-180K	
R49	1800			BTS-180	
R50	470Ω			BTS-470	
R51	68K			BTS-68K	Note 5
R52	27K	3		BTS-27K	
R53	10K			BTS-10K	
R54	2200			BTS-2200	

ITEM No	RATING: OHMS	WATT	REPLACEMENT DATA: ADMIRAL PART No.	IRC PART No.	NOTES
R55	2200			BTS-220	
R56	10K			BTS-10K	
R58	100K			BTS-10K	
R58	390Ω			BTS-390	
R59	22000			BTS-2200	
R60	39K			BTS-39K	
R61	47K			BTS-47K	
R63	100Ω			BTS-100	Note 6
R63	1Meg 5%			BTS-1Meg 5%	Note 7
R64	820K 5%			BTS-820K 5%	Note 8
R65	470Ω	2		BTS-470	
R66	2.2Meg			BTS-2.2Meg	
R67	47K			BTS-47K	
R68	220K			BTS-220K	
R69	2.2Meg			BTS-2.2Meg	
R70	4.7Meg			BTS-4.7Meg	
R71	6800Ω			BTS-6800	
R72	3300Ω			BTS-3300	
R73	3300Ω			BTS-3300	
R74	220K			BTS-220K	
R75	100K			BTS-100K	
R76	1.5Meg			BTS-1.5Meg	
R78	15K			BTS-15K	
R78	150K			BTS-150K	
R79	1.5Meg			BTS-1.5Meg	
R80	220K			BTS-220K	
R81	680Ω			BTS-680	
R82	560Ω				
R83	680Ω				
R84	100K 5%				
R85	100K 5%				
R86	470K				
R87	4.7Meg				
R88	5600Ω				
R89	82K				
R90	5600Ω				
R91	680Ω				
R92	1500Ω				
R93	150	1			
R94	270Ω				
R95	100Ω				
R96	470K			BTS-470K	
R97	100Ω			BTS-100	
R98	680Ω			BTS-680	
R99	18K	2		BTS-18K	Note 11
R100	18K	3		BTS-18K	Note 5
R101	4.7Ω 5%			BW1-4.7 5%	
R102	270K			BTS-270K	Note 12

Note 1: A 6800Ω resistor may be used in some versions.
Note 2: A 220K resistor may be used in some versions.
Note 3: A 12K resistor may be used in some versions.
Note 4: Chassis 18Y4SBA, 18Y4ESA, 18Y4EFA, 18Y4PSA, 18Y4LSA may use a 12K resistor in this application.
Note 5: Not used in some versions.
Note 6: Chassis 18Y4SBA, 18Y4ESA, 18Y4EFA, 18Y4PSA & 18Y4LSA may use 150Ω in this application.
Note 7: Chassis 18Y4SBA, 18Y4ESA, 18Y4EFA, 18Y4PSA & 18Y4LSA may use 820K 5% in this application.
Note 8: Chassis 18Y4SBA, 18Y4ESA, 18Y4EFA, 18Y4PSA & 18Y4LSA may use 680K 5% in this application.
Note 9: Some versions may use a 3900Ω resistor in this application.
Note 10: Some versions use a 1.2Ω resistor in this application.
Note 11: Chassis 18Y4SBA, 18Y4ESA, 18Y4EFA, 18Y4PSA & 18Y4LSA may use a 5600Ω resistor in this application.

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	1	78B11-26	F1-5	RTV-552	HQ1-584	U8-645	Contrast
B	1Meg			R2-54	Not Req.	Not Req.	Not Req.	Volume
C	Switch			KB-1	Not Req.	Not Req.	Not Req.	
R2A	100K	1/2	78C10-8	B-48	A47-100K-S	Q11-139	U43	Vert. Hold
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
	200K	1/2	78C10-85	B-49	A47-200K-S	Q11-140	U43	Vert. Hold ①
	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R3A	100K	1/2	78D11-53	B-49	A47-100K-S	Q13-128	U41	Brightness
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
	100K	1/2	78C10-9	B-48	A47-100K-S	Q13-128	U41	Brightness①
	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R4A	500KΩ		78C30-7	B-8	A47-500Ω-S	Q11-113	U9	Vert. Lin.
B	Shaft			Not Req.	FKS-4	BQ	Not Req.	
R5A	2.5Meg		78C30-1	BX-83	A47-2.5Meg-S	Q11-239	SU-565	Height
B	Shaft			Not Req.	FKS-4	BQ	Not Req.	

* Concentrikit Equivalent, Kit K-7, Base Elements & Shafts, B7-128 & P17-300 (Front)
B13-187 & R2-318 (Rear)
76-1 Switch

① Alternate control used in some versions.

COILS (RF-IF)

ITEM No.	USE	ADMIRAL PART No.	NOTES
L1A	Ant., RF, Mixer Grid, Osc. Coils	AC305	Channels 2, 3, 4
B	Ant., RF, Mixer Grid, Osc. Coils	AC306	Channels 5, 6
C	Ant., RF, Mixer Grid, Osc. Coils	AC307	Channels 7, 8, 9

ITEM No.	USE	ADMIRAL PART No.	NOTES
L1D	Ant., RF, Mixer Grid, Osc. Coils	AC308	Channels 10, 11
E	Ant., RF, Mixer Grid, Osc. Coils	AC309	Channels 13, 13
L2	Neutr. Coil	72A-151	
L3	Mixer Plate Coil		

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L4	37.25MC Trap	72C152-5				
L5	1st Video IF	72C152-6				
L6	2nd Video IF	72C152-4				
L7	31.5MC Trap	72C152-3				
L8	3rd Video IF	72C152-2				Includes .00EMFD Cap.
L9	4th Video IF	72B153-2				

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L10	Series Peaking Coil	73A24-2	19-3036	TV-180	6176	35 Microhenries
L11	Series Peaking Coil	73B5-26	19-3180*	TV-184*	6180*	188 Microhenries; Wound on 4700Ω resistor.
L12	Shunt Peaking Coil	73B5-25	19-3500		6174	505 Microhenries
L13	4.5MC Trap	72C132-1				
L14	Series Peaking Coil	73B5-14	19-3250▲	TV-185▲	6181▲	254 Microhenries; Wound on 18K resistor.
L15	Shunt Peaking Coil	73A11-1			6156■	790 Microhenries; Wound on 10K resistor.
L16	Sound IF	72C132-1				
L17	Ratio Det.	72C68-2	17-1033	TV-110	1498	Tertiary winding = .7Ω

* Parallel with 4700Ω resistor.
▲ Parallel with 18K resistor.
■ Parallel with 10K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L18	53Ω		94C17-4		TV-164					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L19	.220A	55Ω	1.3HY	74B18-13	C5037 ①	C-2996①	C-2326①	28C44 ①	C-24X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA	
K1	Vertical Intergrator	2000MMF, 5000MMF, 5000MMF, 22K, 8200Ω, 8200Ω	63C9-1	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-100 115TM1 1405-01 V-1

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						
	CURRENT (Measured)	ADMIRAL PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1		93A5-2 ①③	1215 ①②		1T1 ①②			

① Selenium type, horiz. phase detector.
② 2 Required.
③ Used in chassis 18Z4ESB, 18Z4FSB stamped run 10-13; chassis 18Y4LSA, 18Y4EFA, 18Y4PSA stamped run 19 and higher; chassis 18Y4BSA stamped run 18; chassis 18Z4ESA, 18Z4PSA, 18Z4ES, 18Z4FS, 18Z4FSA, 18Z4LSA stamped run 10-13; (chassis 18Z4ESB, 18Z4FSB stamped run 14; chassis 18Y4ESA stamped run 18 & lower; chassis 18Y4BSA stamped run 19; chassis 18Z4ESA, 18Z4PSA, 18Z4ES, 18Z4FS, 18Z4FSA, 18Z4LSA stamped run 14 use 6AL5 tube in this application).

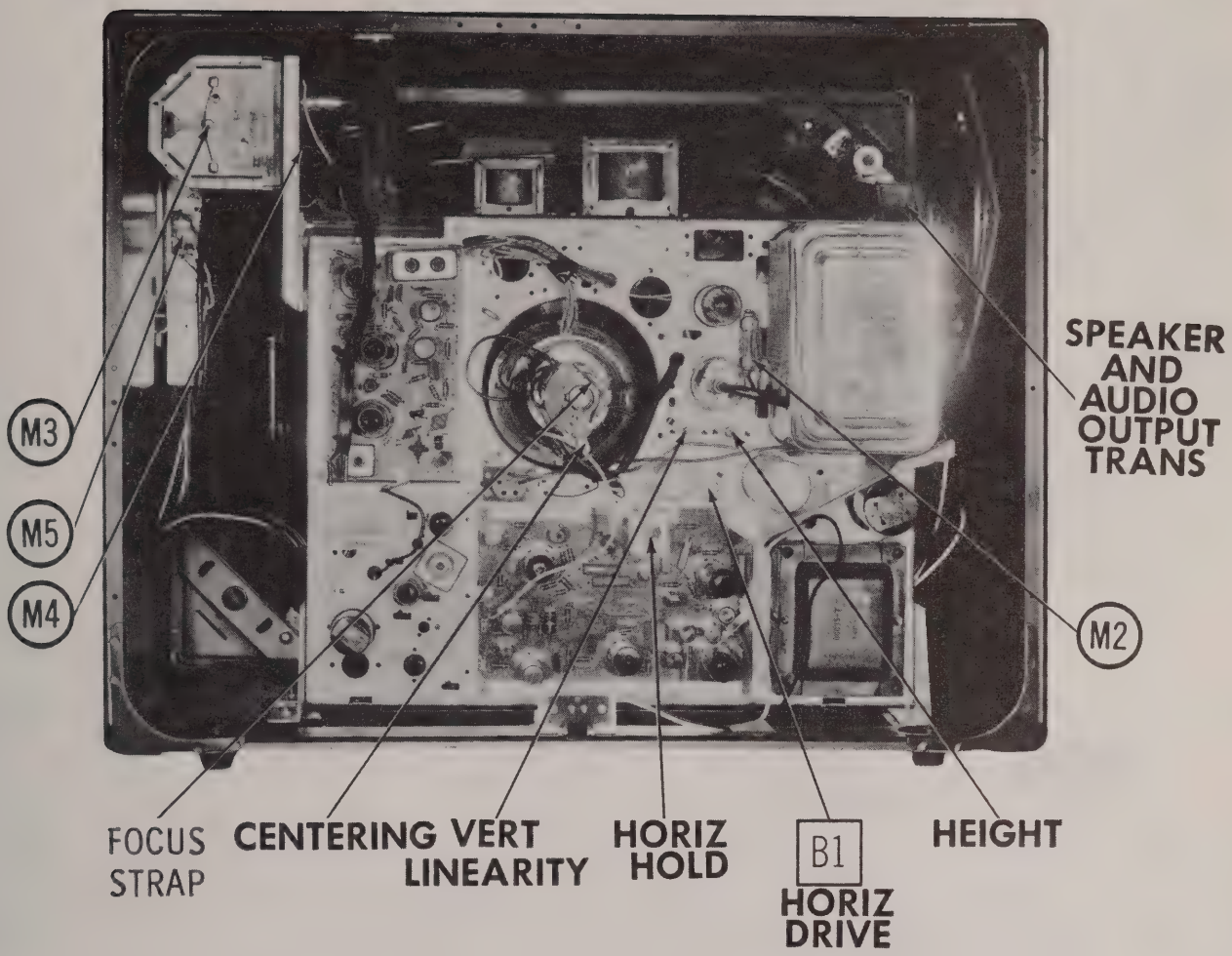
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ADMIRAL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	1/2A 125V S/B	84A1-3*	84A5-4	313.500 (3AG-½A-S/B)	357001	MDL 1/2	4405

* Not used in early versions.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Dial Light	81A1-12	#51-Not used in some versions.
M4	Tuner	94D100-1	VHF, Used in chassis 18Z4PSA.
	Tuner	94D100	VHF, Used in chassis 18Y4ESA, EFA, PSA, LSA, BSA(Run 18, 19)
	Tuner	94D100-2	VHF, Used in chassis 18Z4ESA, FSA, LSA, PSA.
	Tuner	94E142-1	VHF, Used in chassis 18Z4ESB, FSB stamped run 13-15.
	Tuner	94D110-2	VHF, Used in chassis 18Z4ES, FS.
M5	Ant. Matching Network	AB313	Includes Coils and Caps.
M6	Switch	76A31-1	Local-Distance, Rotary Wafer Type.
M7	Centering Device	94B121-1	Includes Rear Yoke Cover.
M8	Ion Trap	94A15-4	
	Yoke Clamp	19A112-3	
	Printed Board	A4861-4	Video IF
	Printed Board	A5294	Sync, Used with 6CG7, Alt. part #A4864-2 used with 12AU7.
	Focus Jumper	18A134	
	Sync Couplate	63C64	Not used in some versions.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

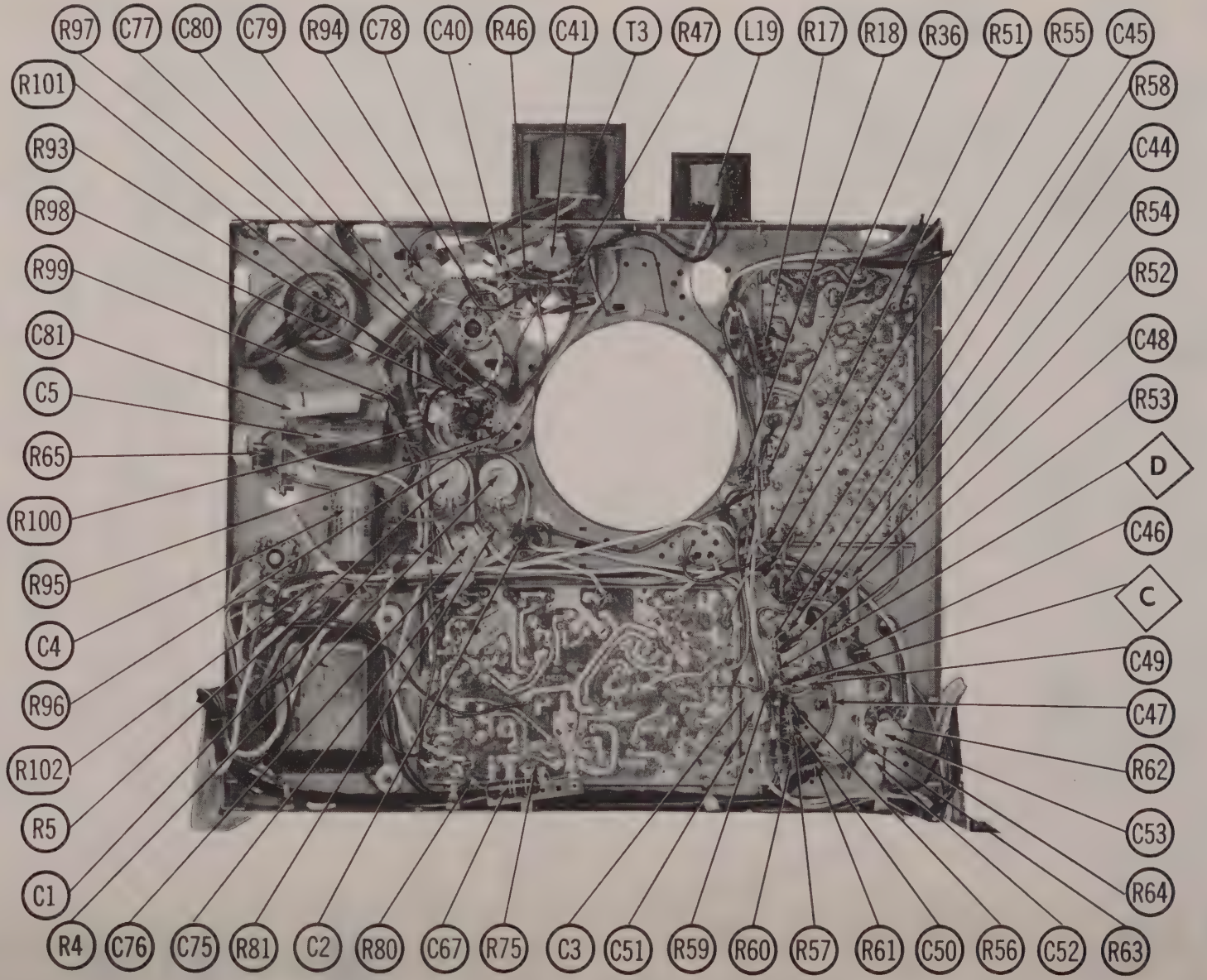
2. Set the brightness and contrast controls for a normal picture.

3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync.

5. Turn to an unused channel. If vertical lines appear near the center of the screen, slowly adjust the horizontal drive trimmer (B1) until white lines disappear.

6. If in step 5 the horizontal drive was adjusted, tune in a TV station and repeat steps 3 and 4. Check horizontal sync by switching off channel and back again.



CHASSIS BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ELECTRO-VOICE
MODEL A20CL

ELECTRO-VOICE
MODEL A20CL

TRADE NAME	Electro-Voice Model A20CL
MANUFACTURER	Electro-Voice, Inc., Buchanan, Michigan
TYPE SET	AC Operated 20 Watt Equalizer Amplifier
TUBES (Eight)	Types 12AD7 Phono Preamplifier, 12AX7 AF Amplifier, 12AX7 AF Amp. -Phase Inv., 12BH7A Driver, (2) 6V6GT Output, (2) 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC - 60 Cycles RATING .78 Amp. @ 117 Volts AC (80 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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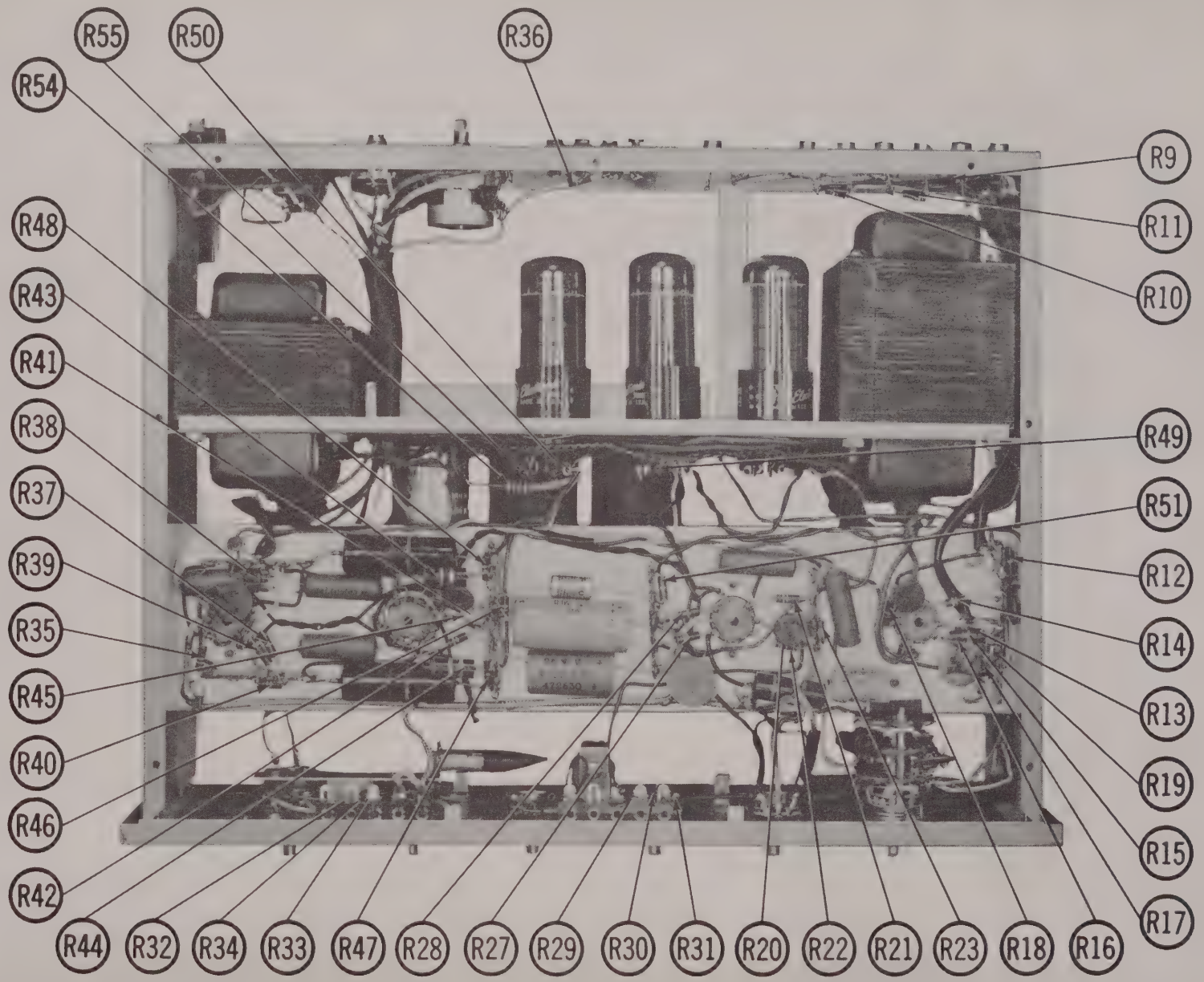
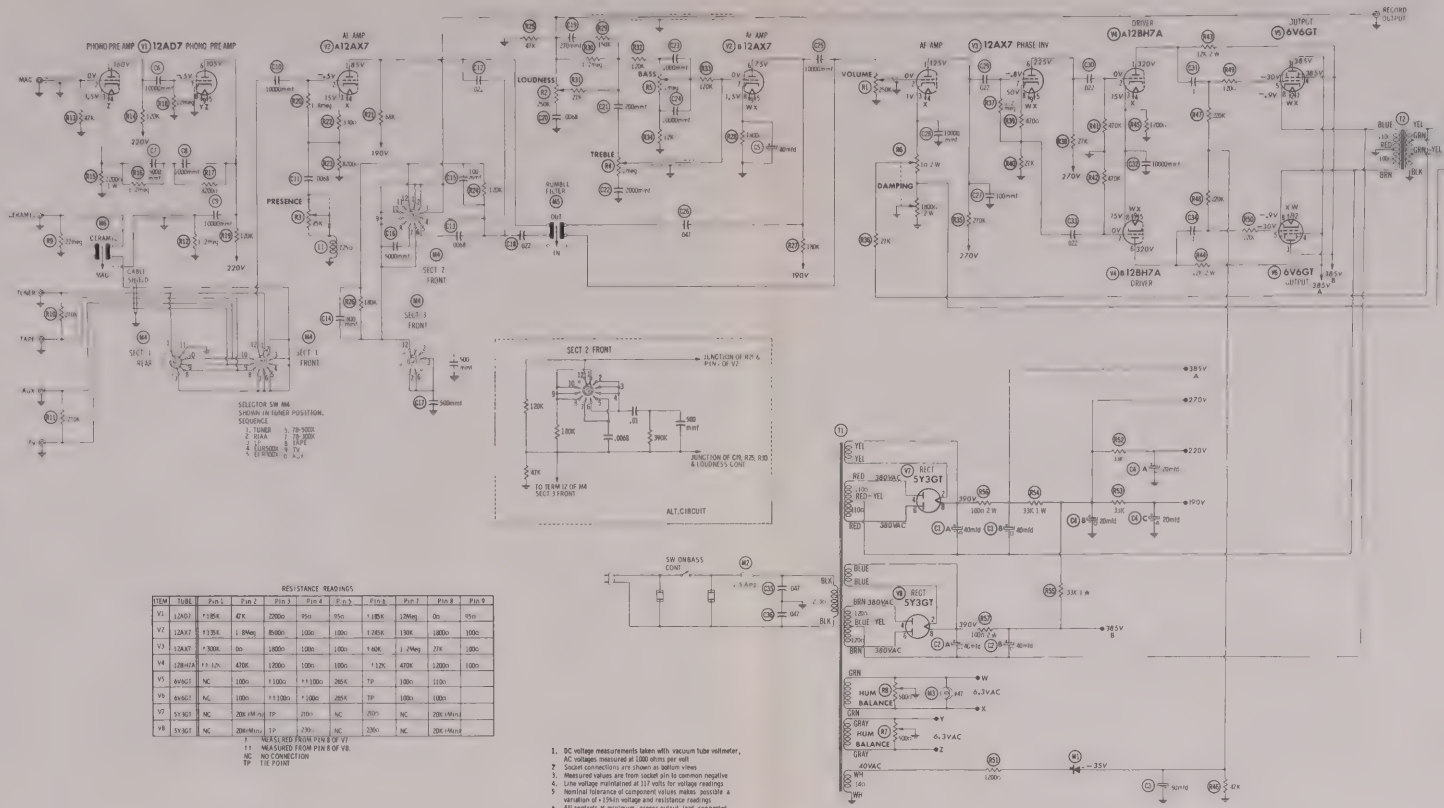


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AD7	†185K	47K	2200Ω	95Ω	95Ω	†185K	12Meg	0Ω	95Ω
V2	12AX7	†135K	1.8Meg	850Ω	100Ω	100Ω	†245K	130K	1800Ω	100Ω
V3	12AX7	†300K	0Ω	1800Ω	100Ω	100Ω	†60K	1.2Meg	22K	100Ω
V4	12BH7A	††1.2M	470K	1200Ω	100Ω	100Ω	†12K	470K	1200Ω	100Ω
V5	6V6GT	NC	100Ω	†100Ω	††100Ω	265K	TP	100Ω	110Ω	
V6	6V6GT	NC	100Ω	††100Ω	†100Ω	265K	TP	100Ω	100Ω	
V7	5Y3GT	NC	20K+Min	TP	210Ω	NC	210Ω	NC	20K+Min	
V8	5Y3GT	NC	20K+Min	TP	230Ω	NC	230Ω	NC	20K+Min	

† MEASURED FROM PIN 8 OF V7
†† MEASURED FROM PIN 8 OF V8
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

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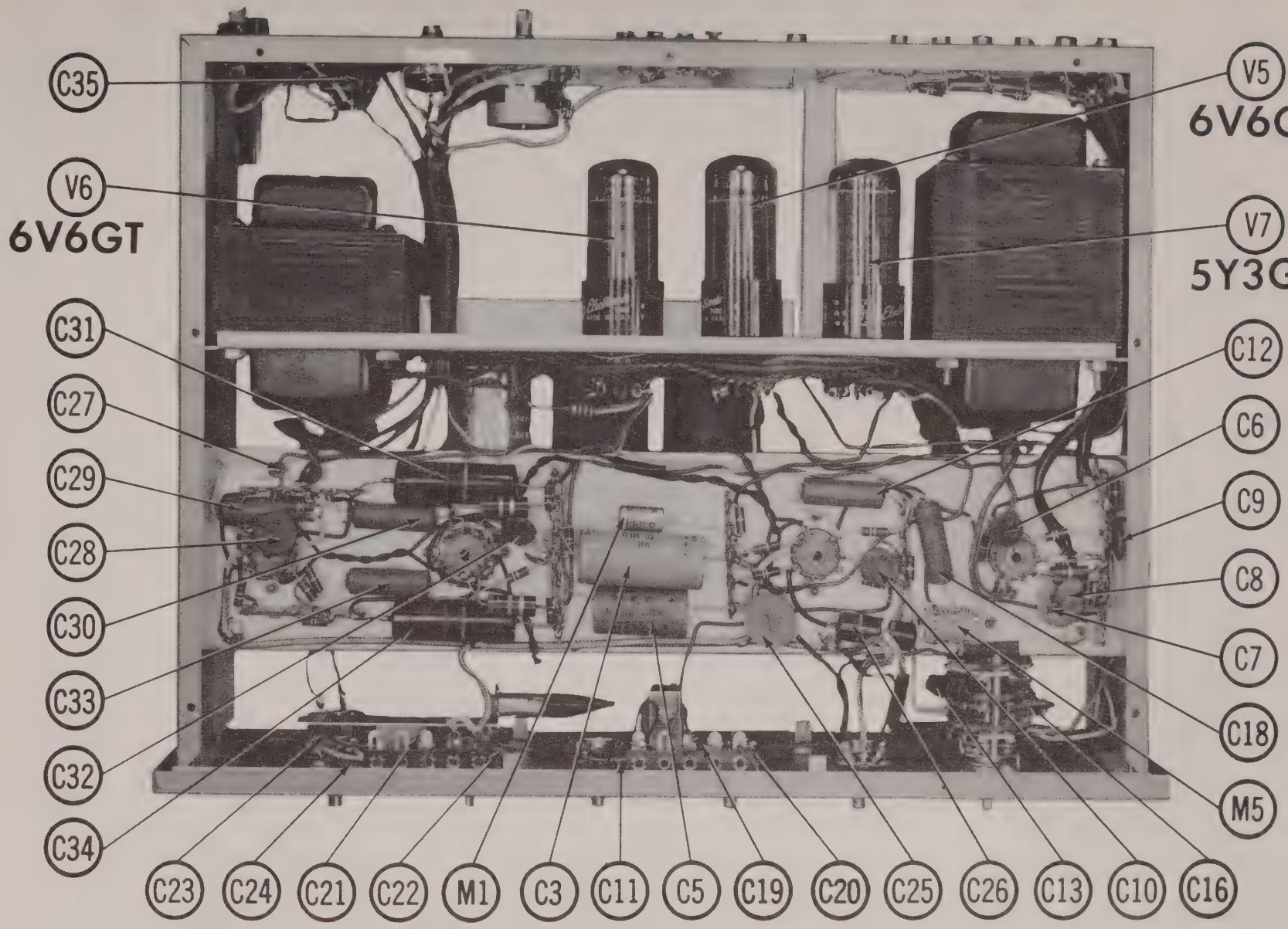
360-3



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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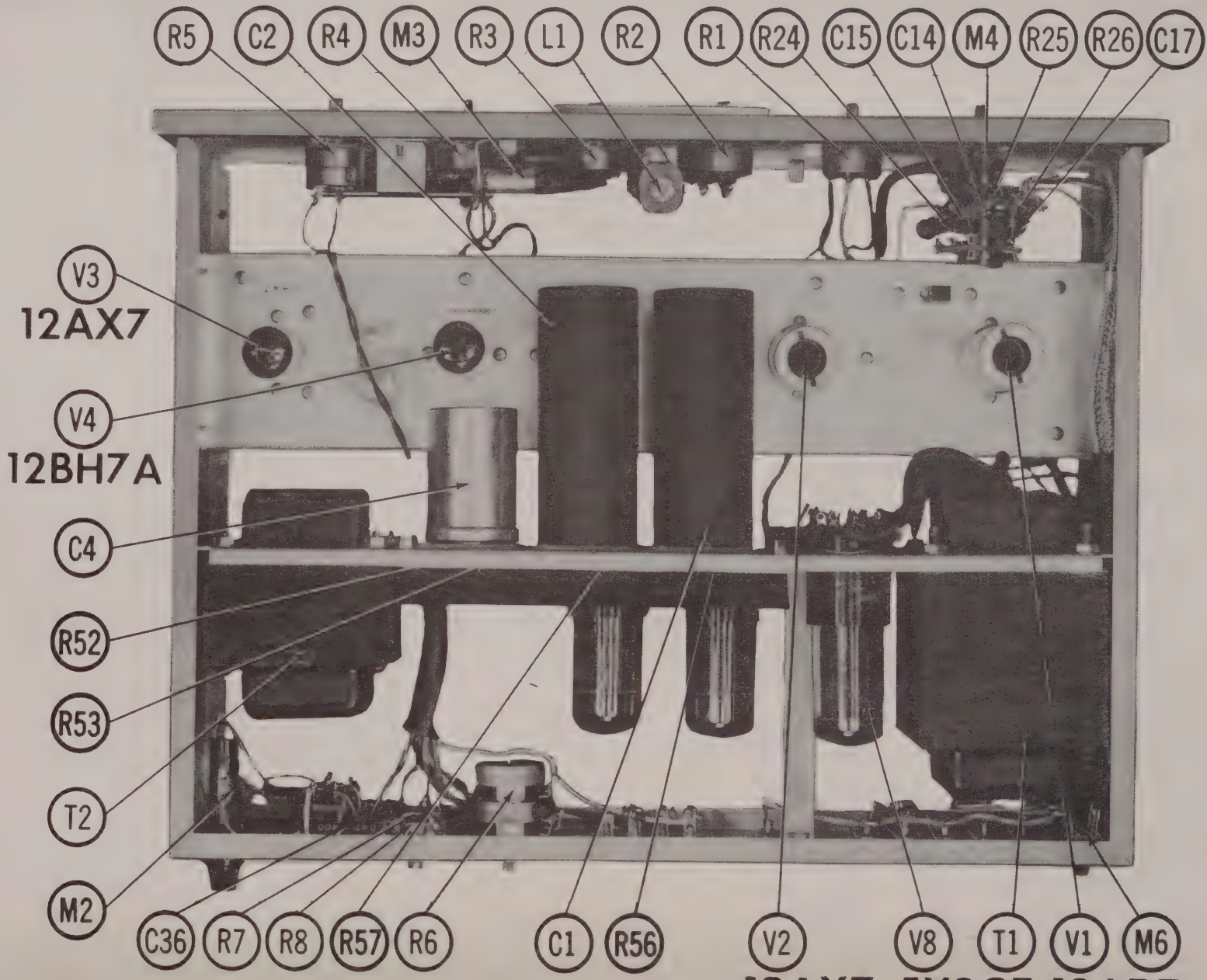

CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono Preamp.	12AD7	
V2	1st AF Amp.	12AX7	
V3	2nd AF Amp. -Phase Inv.	12AX7	
V4	Driver	12BH7A	
V5	Output	6V6GT	
V6	Output	6V6GT	
V7	Rectifier	5Y3GT	
V8	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Electro-Voice PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	500	4247	AFH2-72	BO530	FP288	TMD-62	D-275	TVL-2940
B	■40	500							
C2A	▲40	500	4247	AFH2-72	BO530	FP288	TMD-62	D-275	TVL-2940
B	■40	500							
C3	50	100	4242	PRS150V50	BR5015	TC49	TD-50-150	FM-1550	TVA-1414
C4A	▲20	350	42045	AFH3-36	CO270	FP376.5	TMT-34	T-140	R2368*
B	■20	350							
C	▲20	350							
C5	40	25		PRS150V40	BBR50-25	TC48	TD-40-150	FM-1540	TVA-1413

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Electro-Voice PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C7	5000		42002	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C8	1000		4258	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C9	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C10	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C11	.0068	400	4262	BPD-0068	D6-682	CUB6D68	ED-0068	GEM-6268	6TM-D68	
C12	.022	400	4260	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C13	.0068	400	4262	BPD-0068	D6-682	CUB6D68	ED-0068	GEM-6268	6TM-D68	
C14	800		4253	BPD-0008	DD-801	L10T8	ED-0008		5GA-T8	
C15	100		4281	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C16	5000		42002	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C17	500		42003	BPD-0005	DD-501	L10T5	ED-500	UC-535	5GA-T5	
C18	.022	400	4260	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C19	270		4255	BPD-00027	DD-271	L10T27	ED-270	UC-5327	5GA-T27	
C20	.0068	400	4262	BPD-0068	D6-682	CUB6D68	ED-0068	GEM-6268	6TM-D68	
C21	200		4256	BPD-0002	DD-201	L10T2	ED-200	UC-532	5GA-T2	
C22	2000		4259	BPD-002	DD-202	BYA10D2	ED-002	DC522	5HK-D2	
C23	1000		4258	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C24	10000		4257	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C25	10000		4257	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C26	.047	400	4243	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C27	100		4281	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C28	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C29	.022	400	4260	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C30	.022	400	4260	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C31	.1	600	4241	P688N-1	DF-104	CUB4P1		GEM-601	6TM-P1	
C32	10000		4252	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C33	.022	400	4260	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C34	.1	600	4241	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C35	.047	400	4243	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C36	.047	400	4243	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Electro-Voice PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	250K	½	B46086	B-51	A47-250K-Z	Q13-130	U44	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	250K	½	C46086	B-50	A47-250K-S	Q11-130	U46	Loudness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	25K	½	P4686	B-27	A47-25K-V	Q14-120	U28	Presence
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1Meg	½	Q4686	B-70	A47-1Meg-Z	Q13-137	U53	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	1Meg	½	Z4686	B-70	A47-1Meg-Z	Q13-137	U53	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R6A	1Ω	2	D46086					Damping (Wire-wound)
B	1800Ω	2						Damping (Wire-wound)
R7A	500Ω	½	R4686	B-4	A47-500-S	Q11-103	U2	Magnetic - Phono Hum
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	
R8A	500Ω	½	R4686	B-4	A47-500-S	Q11-103	U2	Ceramic - Phono Hum
B	Shaft			Not Req.	FKS-1/4	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R9	22Meg		4606	BTS-22Meg	
R10	270K		4669	BTS-270K	
R11	270K		4669	BTS-270K	
R12	1.2Meg		4656	BTS-1.2Meg	
R13	47K		4668	BTS-47K	
R14	120K		4670	BTS-120K	
R15	2200Ω	1	4676	BTA-2200	
R16	1.2Meg		4656	BTS-1.2Meg	
R17	8200Ω			BTS-8200	
R18	12Meg		4672	BTS-12Meg	
R19	120K		4670	BTS-120K	
R20	1.8Meg		4673	BTS-1.8Meg	
R21	68K			BTS-68K	
R22	330Ω			BTS-330	
R23	8200Ω			BTS-8200	
R24	120K		4670	BTS-120K	
R25	47K		4668	BTS-47K	
R26	180K		4671	BTS-180K	
R27	180K		4671	BTS-180K	
R28	1800Ω		4677	BTS-1800	
R29	150K		4603	BTS-150K	
R30	1.2Meg		4656	BTS-1.2Meg	
R31	27K		4651	BTS-27K	
R32	120K		4670	BTS-120K	
R33	120K		4670	BTS-120K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Electro-Voice PART No.	IRC PART No.	
R34	12K		4649	BTS-12K	
R35	270K		4669	BTS-270K	
R36	27K		4651	BTS-27K	
R37	1.2Meg		4656	BTS-1.2Meg	
R38	27K		4651	BTS-27K	
R39	470Ω		4654	BTS-470	
R40	27K		4651	BTS-27K	
R41	470K		4650	BTS-470K	
R42	470K		4650	BTS-470K	
R43	12K	2	4679	BTB-12K	
R44	12K	2	4679	BTB-12K	
R45	1200Ω		4658	BTS-1200	
R46	47K		4668	BTS-47K	
R47	220K			BTS-220K	
R48	220K			BTS-220K	
R49	120Ω		4607	BTS-120	
R50	120Ω		4607	BTS-120	
R51	1200Ω		4658	BTS-1200	
R52	33K		4665	BTS-33K	
R53	33K		4665	BTS-33K	
R54	33K	1	4666	BTA-33K	
R55	33K	1	4666	BTA-33K	
R56	100Ω	2	4655	BTB-100	
R57	100Ω	2	4655	BTB-100	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .78A	700VCT @ .032A	700VCT @ .032A	40VAC @ .001A	15022					
	SEC. 4	SEC. 5	SEC. 6	SEC. 7						
	5VAC @ 2A	5VAC @ 2A	6.3VAC @ 2.1A	6.3VAC @ .3A						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Electro-Voice PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2000Ω	16Ω Tap @ 8Ω, 4Ω	15023						

COILS

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Electro-Voice PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Presence Choke	1596				

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Electro-Voice PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.001A	5914	1159	CR10	8S20		12	

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Electro-Voice PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	1½ A 125V S/B	20171		31301.5 (3AG-1½A-S/B)	342001	MDL 1½	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Electro-Voice PART No.	NOTES
M3	Pilot Light		#47
M4	Switch		Function Selector, 3 Gang, Wafer Type
M5	Switch		Rumble Filter, Slide Type, DPDT
M6	Switch		Ceramic-Magnetic, Slide Type, DPDT

PHOTOFACT* Folder

*TRADE MARK

EMERSON MODELS 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211 (Ch. 120306-CM, -EM, 120307-RM)

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EMERSON MODEL 1208 (Ch. 120306-EM)

TRADE NAME	Emerson	MODELS	CHASSIS
		1200, 1202, 1204, 1206, 1208, 1210	120306CM
		1200, 1202, 1204, 1206, 1208, 1210	120306EM
		1201, 1203, 1205, 1207, 1209, 1211	120307RM
MANUFACTURER	Emerson Radio & Phonograph Corp., 14th. & Coles Sts., Jersey City 2, N.J.		
TYPE SET	Television Receiver		
TUBES	Sixteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 120 Watts, 1.1 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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EMERSON MODELS 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211 (Ch. 120306-CM, -EM, 120307-RM)

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

EMERSON MODELS 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211 (Ch. 120306-CM, -EM, 120307-RM)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type control knobs from the front.
2. Remove mask by pulling off.
3. Remove the screws holding the on-off-volume and contrast control bracket.
4. Remove the screws holding the tuner support bracket.
5. Remove 8 wood screws and the rear cover.
6. Remove 2 wood screws and the antenna terminal board.
7. Remove 2 hex nuts holding the side control panel.
8. Remove 2 speaker leads, picture tube socket, ion trap, centering device, width sleeve and HV lead.
9. Remove 4 wood screws holding the top chassis brackets to the cabinet.
10. Remove 3 metal screws (inside the cabinet along the bottom) holding the chassis to the support brackets.
11. Remove the chassis.
12. Remove 2 speaker nuts and the speaker.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

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MODELS	CHASSIS
1200, 1202, 1204, 1206, 1208, 1210	120306CM
1200, 1202, 1204, 1206, 1208, 1210	120306EM
1201, 1203, 1205, 1207, 1209, 1211	120307RM

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 4 push-on type control knobs.
Pull mask off (this is held on by means of clips).
Remove 2 metal screws and the safety glass.

SPECIAL ADJUSTMENTS

A. Picture Stabilizer

In normal signal areas the picture stabilizer control should be set at full clockwise position. In noisy fringe areas rotate counter clockwise for best sync stability.

B. Width

The width may be varied by means of an aluminum sleeve located between the yoke and the picture tube neck. Adjust sleeve in or out of the yoke for a picture SLIGHTLY larger than necessary to fill the screen.

C. Focus

Adjust the ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the discriminator secondary (A10) located on top of chassis.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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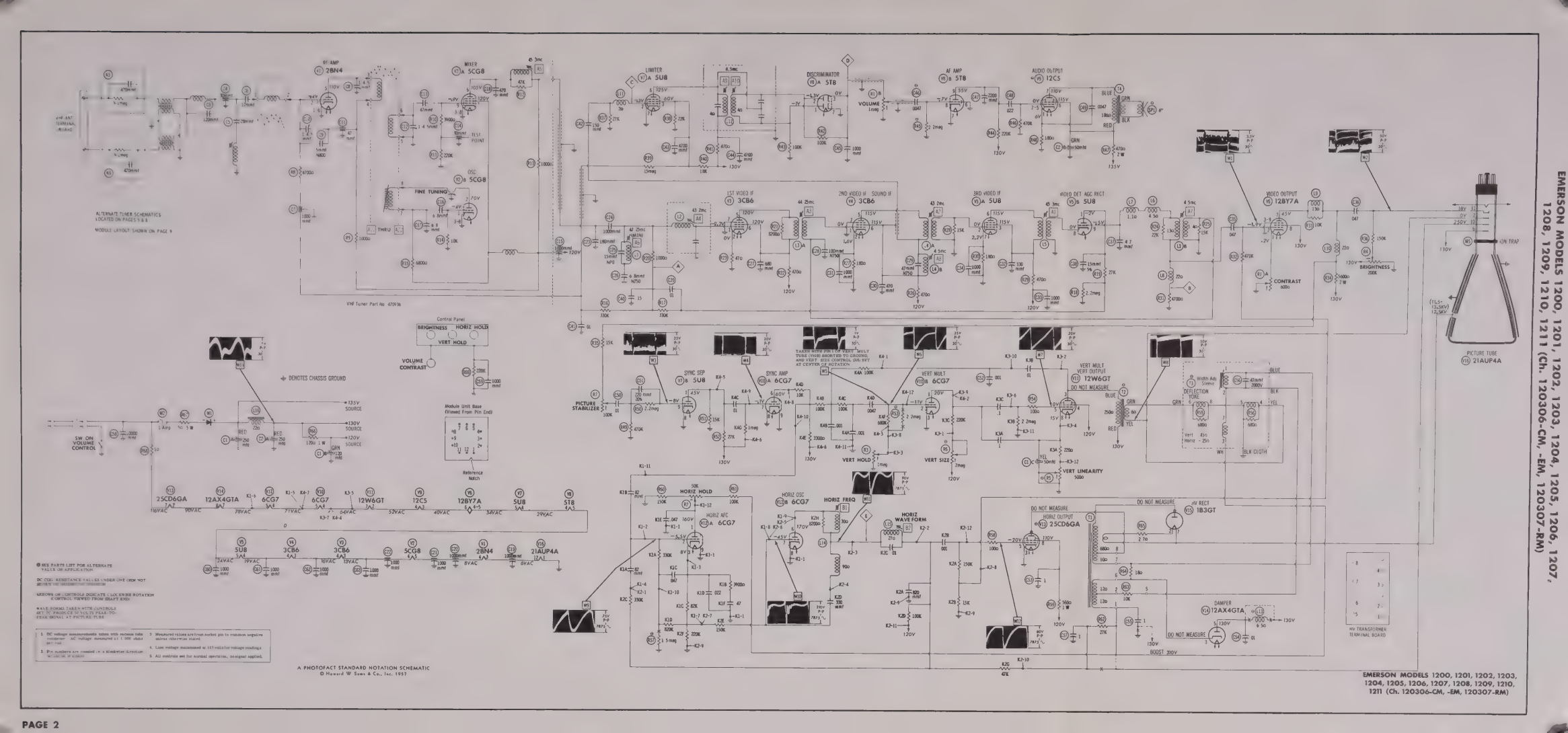

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EMERSON MODELS 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211 (Ch. 120306-CM, -EM, 120307-RM)

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TUBE PLACEMENT CHART

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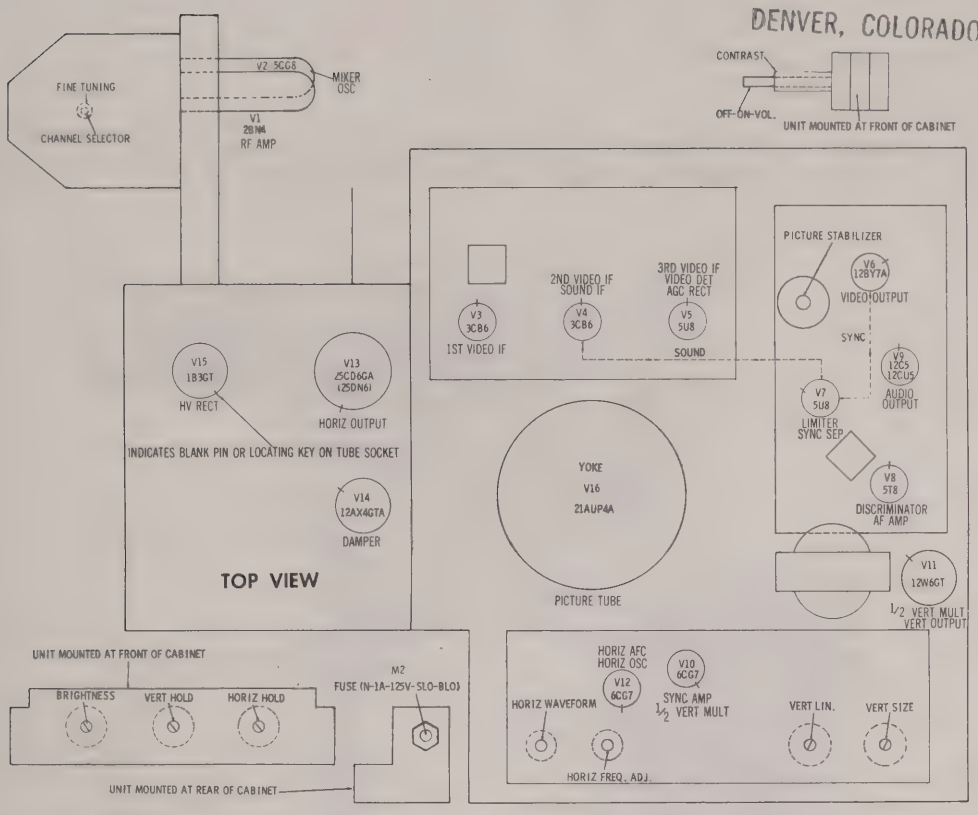


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

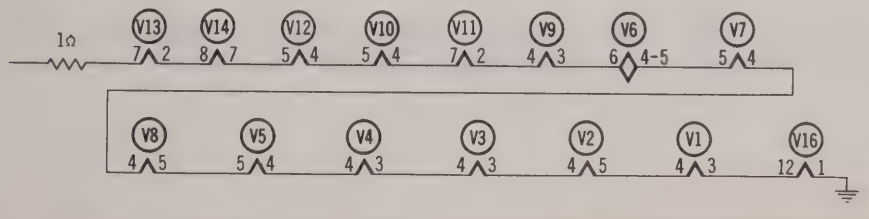
POWER SUPPLY FAILURE
No raster, no sound - Fuse (M2), Rectifier (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V8, V16
Has pic, no sound - V7, V8, V9
Overloaded picture - V5

SYNC FAILURE
No vert. sync - V7, V10
No horiz. sync - V7, V10, V12
No vert. or horiz. sync - V7, V10

SWEEP FAILURE
No raster, has sound - V12, V13, V14, V15, V16
No vertical deflection - V10, V11
Poor vert. linearity or foldover - V10, V11
Poor horiz. linearity or foldover - V12, V13, V14
Narrow picture - V12, V13, V14, M1
Vert. off freq. - V10, V11
Horiz. off freq. - V12

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).



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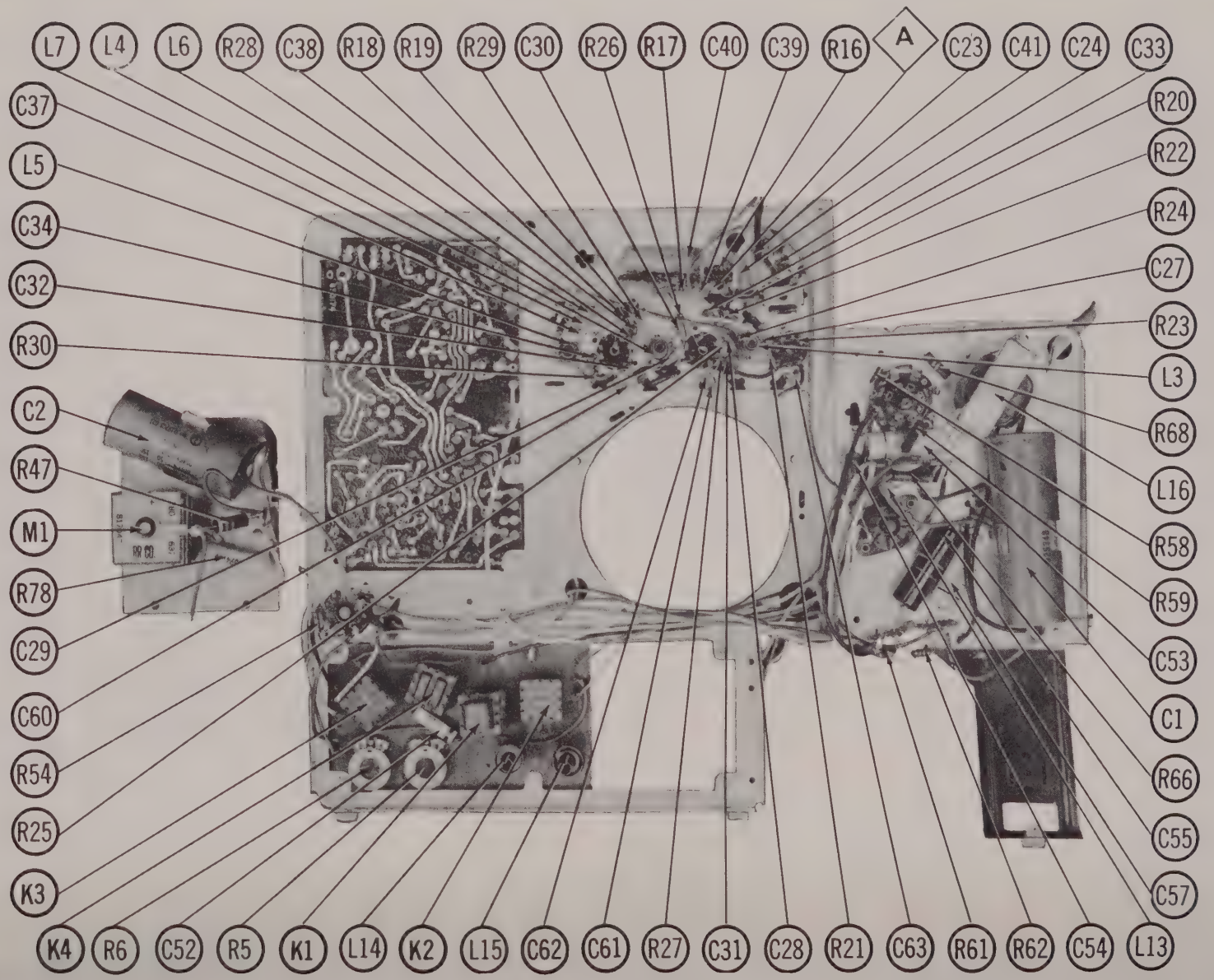
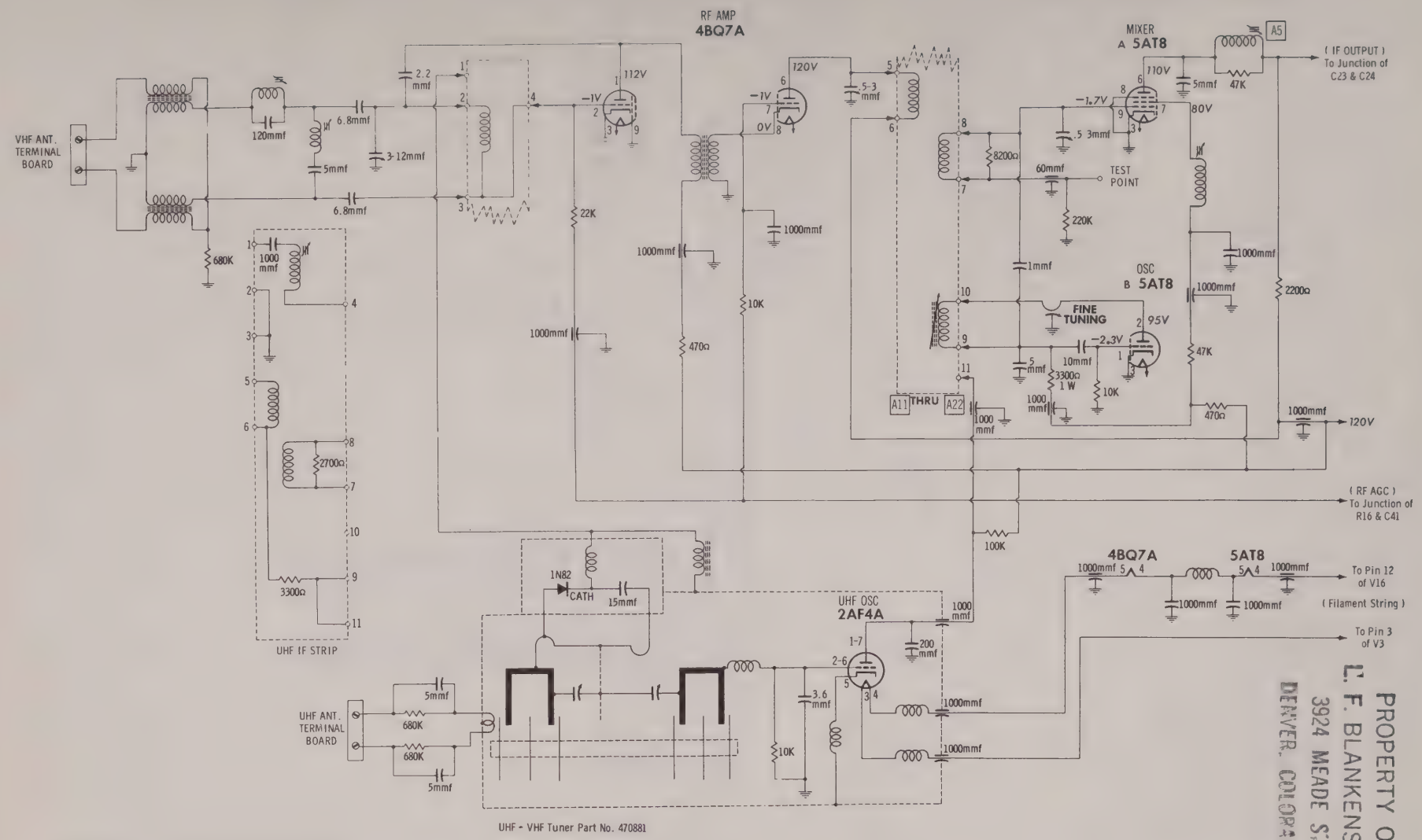


CHASSIS BOTTOM VIEW



UHF - VHF Tuner Part No. 470881

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALTERNATE UHF-VHF TUNER SCHEMATIC

EMERSON MODELS 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211 (Ch. 120306-CM, -EM, 120307-RM)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer-oscillator tube (V2). Low side to chassis. If tube shield cannot be removed, place a thin insulated metal strip between tube and shield for connection.	Not used	45.3MC (Unmod)	Any non-interfering channel	USE VTVM. DC probe to point Ⓑ. Common to chassis.	A1, A5	Attenuate generator output for not more than 2 volts reading on VTVM. Adjust for maximum deflection.
2.	"	"	"	43.2MC	"	"	A2, A4	"
3.	"	"	"	44.25MC	"	"	A3	Adjust for maximum deflection. Repeat steps 1 thru 3.
4.	"	"	"	47.25MC (400∿Mod)	"	Vert. Amp. thru 10K to point Ⓑ. Low side to chassis.	A6	Adjust for MINIMUM 400∿ indication on scope. Use high scope gain and increase generator output.
5.	"	"	44MC (10MC Swp)	41.25MC 44.0MC 45.75MC 47.25MC	"	"		Use only enough sweep generator output to provide usable pattern on scope. Check for response curve similar to Fig. 1. If necessary, SLIGHTLY retouch A1 thru A5 to obtain desired response. If video carrier marker (45.75MC) is too high, readjust A5. If too low, readjust A3.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.1MFD	High side to pin 9 (grid) of 5U8 (V6). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point Ⓒ. Common to chassis.	A7, A8	Adjust for maximum deflection.
7.	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A9, A10	Detune A10 for maximum negative deflection. Adjust A9 for maximum deflection. Readjust A10 for zero reading on VTVM. A positive and negative reading will be obtained on either side of correct setting.

VHF OSCILLATOR ALIGNMENT FOR TUNERS #470936 & 470881

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis.	All	Adjust to place sound marker in trap notch as in Fig. 2. Video marker should fall at 30 to 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A12	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A13	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A14	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A15	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A16	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A17	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A18	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A19	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A20	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A21	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A22	

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT FOR TUNER #470926

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (B). Low side to chassis.	A23	Adjust to place sound marker in trap notch as in Fig. 2. Video marker should fall at 30 to 50%. Adjustments A24 thru A29 are adjusted by bending coil loops. A31 and A33 are adjusted by expanding or compressing coil turns.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A24	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A25	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A26	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A27	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A28	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A29	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A30	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A31	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A32	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A33	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A34	

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

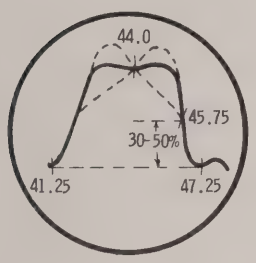


FIG. 1

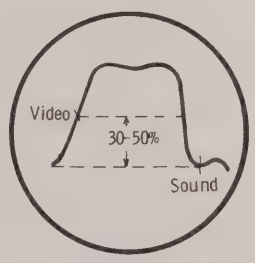
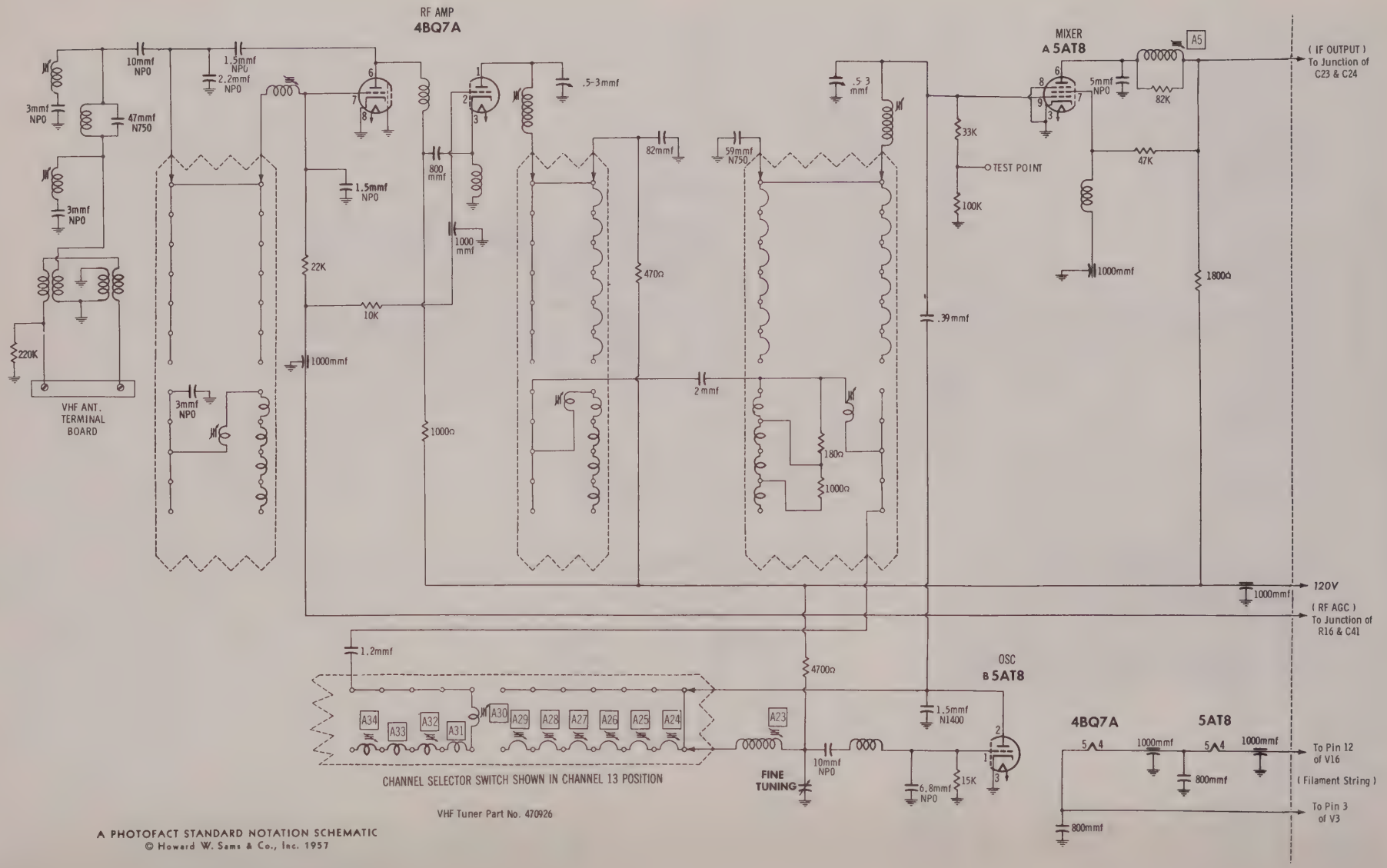


FIG. 2



VHF Tuner Part No. 470926

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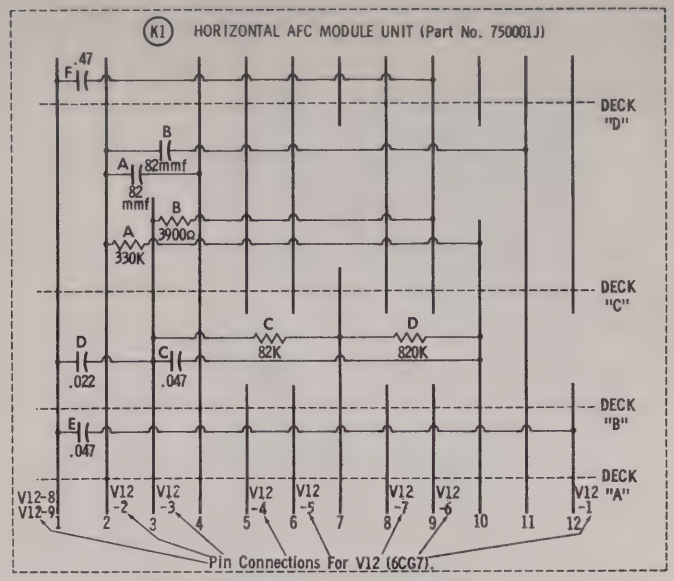
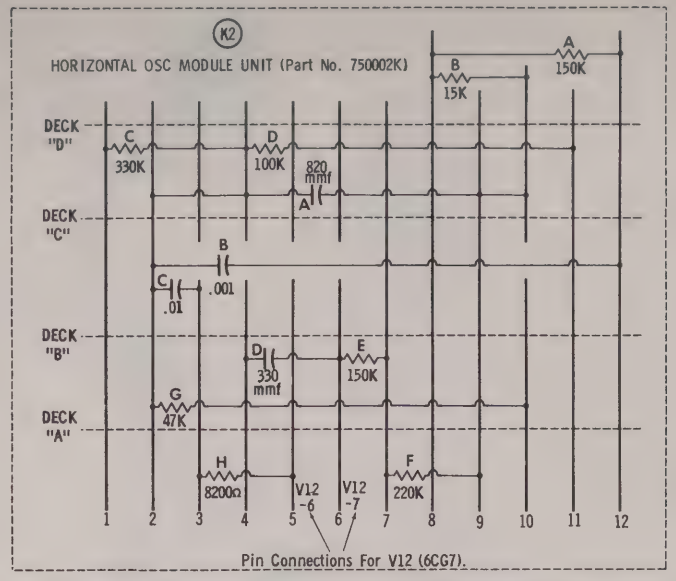
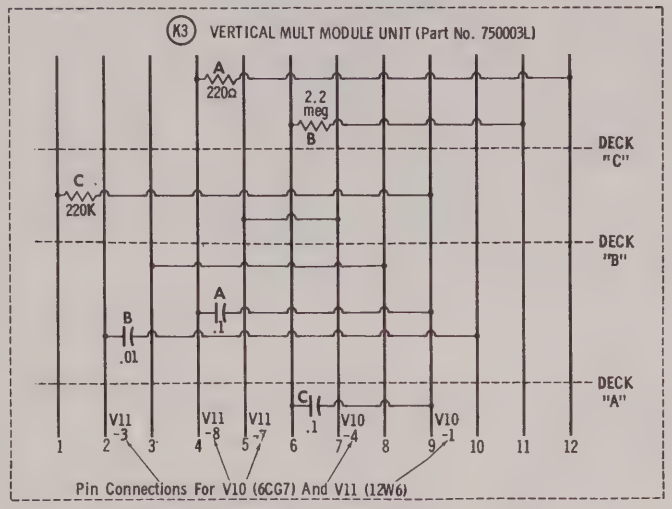
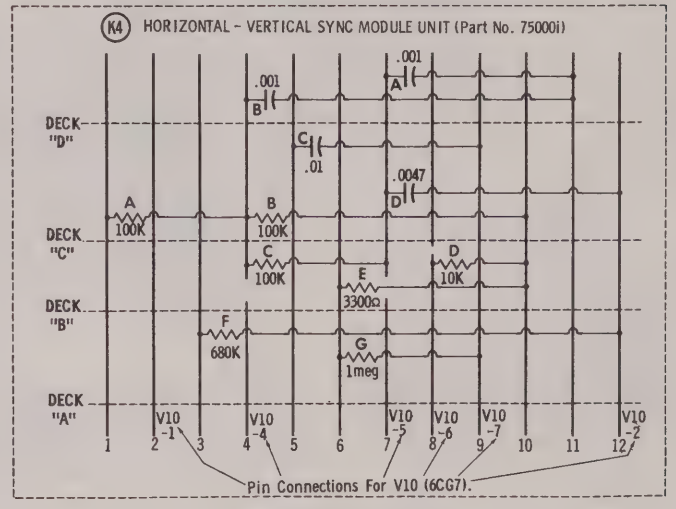
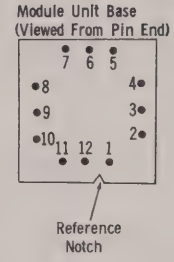
ALTERNATE VHF TUNER SCHEMATIC











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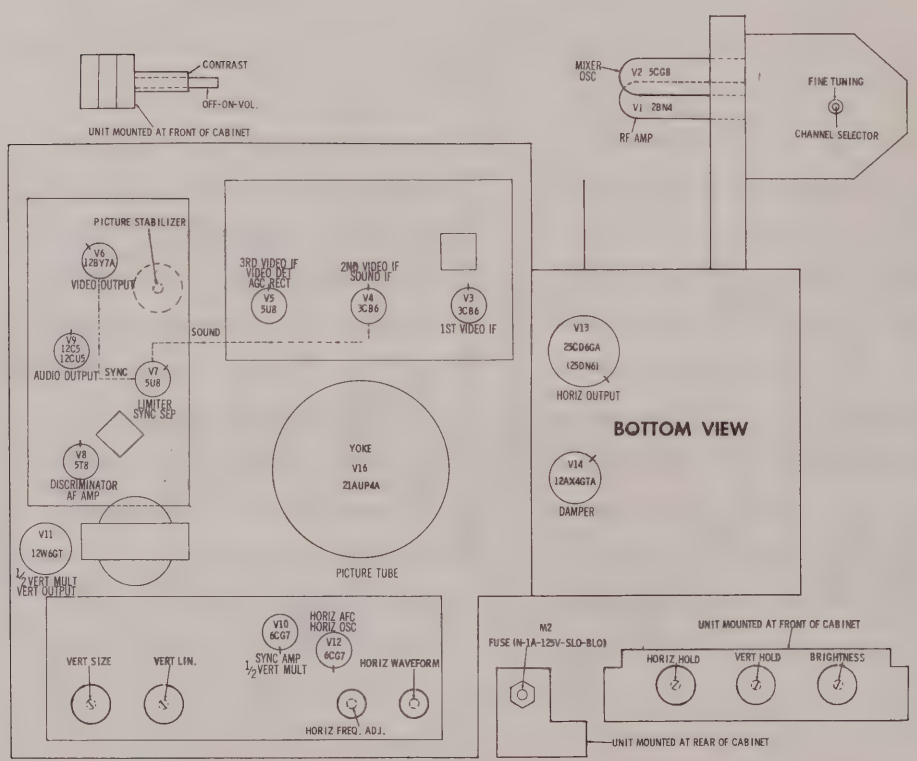
MODULAR LAYOUT

EMERSON MODELS 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211 (Ch. 120306-CM, -EM, 120307-RM)

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	2.3Meg	1.5Ω	2Ω	†1140Ω	0Ω	2.3Meg		
V2	5CG8	10K	†6940Ω	0Ω	3Ω	2Ω	†1140Ω	†140Ω	0Ω	224K
V3	3CB6	2.5Meg	47Ω	3Ω	4Ω	†600Ω	†600Ω	0Ω		
V4	3CB6	1.4Ω	180Ω	4Ω	5Ω	†600Ω	†600Ω	0Ω		
V5	5U8	2.2Meg	.1Ω	†600Ω	5Ω	6Ω	†600Ω	180Ω	.1Ω	4700Ω
V6	12BY7A	120Ω	480K	0Ω	8Ω	8Ω	9Ω	†5600Ω	†22Ω	0Ω
V7	5U8	†12K	27K	†12K	7Ω	8Ω	†600Ω	0Ω	0Ω	2.7Meg
V8	5T8	100K	100K	170K	7Ω	6Ω	0Ω	0Ω	2.2Meg	†220K
V9	12C5	180Ω	470K	9Ω	11.5Ω	470K	†470Ω	†650Ω		
V10	6CG7	†•1.2Meg	•1Meg	0Ω	14Ω	15Ω	†13K	†1Meg	0Ω	0Ω
V11	12W6GT	TP	11.5Ω	†270Ω	†140Ω	2.2Meg	TP	14Ω	•500Ω	
V12	6CG7	‡•80K	850K	250K	15Ω	16Ω	†70K	300K	0Ω	0Ω
V13	25CD6GA	NC	18Ω	0Ω	TP	160K	TP	23Ω	†700Ω	TOP CAP ‡28Ω
V14	12AX4GTA	NC	NC	¶	NC	†28Ω	NC	16Ω	18Ω	
V15	1B3GT	PINS	1 THRU 8	HAVE	INF	RESISTANCE				TOP CAP ‡700Ω
V16	21AUP4A	0Ω	12Ω	PIN 6 †22Ω	PIN 10 ‡27K	PIN 11 •170K	PIN 12 1.5Ω			

TP TIE POINT
NC NO CONNECTION
† MEASURED FROM OUTPUT OF M1.
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
‡ MEASURED FROM PIN 3 OF V14.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	2BN4	
V2	Mixer-Oscillator	6CG8	
V3	1st Video IF Amp.	6CH6	
V4	2nd Video IF Amp.- Sound IF Amp	3CB6	
V5	3rd Video Amp -Video Det -AGC-Rectifier	8U8	
V6	Video Output	12BY7A	
V7	Limiter-Sync Sep	9U8	
V8	Discriminator AF Amp	5T8	
V9	Audio Output	12C8	Note 1
V10	Sync Amplifier-Vert Mult	6CG7	
V11	Vert Mult.-Vert Output	12AW6GT	
V12	Horiz AFC-Horiz Osc	6CG7	
V13	Horiz. Output	25CD6GA	Note 2
V14	Damper	12AX4GTA	
V15	HV Rectifier	1B3GTA	

Note 1. A 12CU5 may be used in some applications.
Note 2. A 25DN6 may be used in some applications.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	EMERSON Part No.	CBS Part No.	GENERAL ELECTRIC Part No.	SYLVANIA Part No.	
V16	21AUP4A	21AUP4A ③	21AUP4B/21AUP4A ③	21AUP4A/ 21AUP4B ①	① Silver screen "55" ② Aluminized
		21AUP4	21AUP4	21AVP4A, 21AVP4B ①	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	EMERSON Part No.	AEROVOX Part No.	CORNELL-DUBILIER Part No.	MALLORY Part No.	PYRAMID Part No.	SANGAMO Part No.	SPRAGUE Part No.
C1A	250	150	925248	FR3-043		WD251			R1998 *
B	120	150				TC495			
C	50	25							
C1A	250	150	926343	FR2-120		WD251		8-115	R1995 *
B	50	150						MT-1550	

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	EMERSON Part No	AEROVOX Part No	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	
C3	120			BPD-00012	DD-121	L10T12	ED-120	UC-5312	5GA-T12	
C4	30									
C5	28									
C6	14									
C7	1000			EF-001	MFT-1000		532-B		503C-D1	
C8	1-4.5				MFT-1000					
C9	5						532-B			N800
C10	1-4.5				MFT-1000		532-B			
C11	47									
C12	1-4.5			EF-001	MFT-1000		532-B		503C-D1	
C13	47									
C14	30									
C15	1000			EF-001	MFT-1000				503C-D1	
C16	6 8									
C17	6 8									
C18	470			BPD-00047	DD-471	BYA107A7	ED-470	UC-5347	5GA-T47	
C19	1000			EF-001	MFT-1000				503C-D1	
C20	1000			EF-001	MFT-1000				503C-D1	
C21	1000			EF-001	MFT-1000				503C-D1	
C22	1000			EF-001	MFT-1000				503C-D1	
C23	180		926900	BPD-00018	DD-181	L10T18	ED-180	UC-5318	5GA-T18	
C24	1000		928833	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C25	15		928872	NPO-81.15	TCZ-15	C10Q15C	TCO-15		2TCC-Q15	NP0
C26	6 8		926886	N750-81 6 8	TCN-681	C10V68U	TCT-6 8	ZT-5568	5TCC5-V68	N750
C27	680		926909	N750-81 680	TCN-681	BYA10T68	ED-680	UC-5368	5GA-T68	
C28	100		926897	N750-81 100	TCN-100	C10T1U	TCT-100	NT-531	5TCU-T1	N750
C29	47		926895	N750-81 47	TCN-47	C10Q47U	TCT-47	NT-5447	5TCU-Q47	N750
C30	470		925907	BPD-00047	DD-471	BYA107A7	ED-470	UC-5347	5GA-T47	
C31	1000		928833	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C32	330		926905	BPD-00033	DD-331	L10T33	ED-330	UC-5333	5GA-T33	
C33	1000		928833	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C34	1000		928833	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C35	.047	400	920027	BPD-05	DF-503	CUB4S47		GEM-4347	4TM-S47	
C36	.047	400	926954	BPD-05	DF-503	CUB4S47		GEM-4347	4TM-S47	
C37	4.7		928813	NPO-81 4.7	TCZ-4R7	C10V47C	TCC-4.7	ZT-5547	5TCCB-V47	
C38	15		928872	NPO-81 15	TCZ-15	C10Q15C	TCC-15		5TCC-Q15	5%
C39	.01	400	928314	BPD-01	DD-103	CUB4S1		GP-10000	GEM-431	4TM-S1
C40	.15	300	923531	P28SN-15		CUB2P15			GEM-2015	2TM-P15
C41	.01	600	923516	BPD-01	DD-103	CUB4S1		GP-10000	GEM-431	4TM-S1
C42	150		928903	BPD-00015	DD-151	L10T15	ED-150	UC-5315	5GA-T15	
C43	4700		928923	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C44	4700		928923	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C45	1000		928913	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C46	.0047	400		BPD-0047	DD-472	CUB4D47	GP-4700	GEM-4247	4TM-D47	Note 1
C47	2200		928921	BPD-0022	DD-222	BYA10D22	ED-0022	UC-5222	5GA-D22	
C48	.022	400		BPD-02	DF-203	CUB4S22	ED-S3	GEM-4232	4TM-S24	
C49	.0047	600	924753	BPD-0047	DE-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C50	.01	400	924514	BPD-01	DD-103	CUB4S1	GP-10000	GEM-431	4TM-S1	
C51	220		941154	3465-00022	DD-221	SW5T22	ED-220	UC-5322	5FM-322	
C52	.001	600	928930	BPD-001	DD-102	CUB4S1	GP-1000	GEM-431	4TM-S1	
C53	.1	400	924515	P48SN-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C54	.01	400	923514	BPD-01	DD-103	CUB4S1	GP-10000	GEM-431	4TM-S1	
C55	.1	600	924515	P48SN-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C56	47	4000	928920	EVD-40-47	DE6S-470	EVD20Q47	HZS-47	DC30447	40GAB-047	
C57	.1	400	924515	P48SN-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C58	10000		923501	BPD-01	DD-103	BYA501	ED-01	DC511	5HK-S1	
C59	1000		928927	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C60	1000		928933	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C61	1000		928933	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C62	1000		928933	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	
C63	1000		928933	BPD-001	DD-102	BYA501	ED-1000	DC512	5HK-D1	

Note 1. Some versions use a .0022MFD (Part #920053 or 923522) in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON Part No.	CENTRALAB Part No.	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No
R1A	600Ω	½	990407	F3-2	RTV-585	* QJ-1008	UE416
B	1Meg			R2-33	Not Req		Not Req.
C	Switch			KB-1	Not Req.		Not Req.
R2A	50K	½	990410	B-31	A47-50K-B	QJ-133	UE6
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.
R3A	1Meg	½	990425	B-69	A47-1Meg-B	QJ-137	UE4
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.
R4A	200K	½	990428	B-46	A47-200K-B	QJ-129	U43
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.
R5A	500Ω	½	990427 ①				PTA35L,
B	Shaft						Not Req.
R6A	2Meg	½	990426 ②				PTA36L,
B	Shaft						Not Req.
R7	100K	½	990404				Picture Stabilizer

Contrast Volume
Horiz. Hold
Vert. Hold
Brightness
Vert. Lin.
Vert. Size

* Conectrisit Equivalent: K-6 Kit, Base Elements & Shafts B17-106, P17-105 (Panel) B13-127, R1-118 (Rear) T8-1 (Switch)

① Alternate part #990408.
② Alternate part #990409.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON Part No	IRC Part No.	
R8	4700Ω			BTS-4700	
R9	1000Ω		3504923	BTS-1000	
R10	3900Ω			BTS-3900	
R11	330K		3810923	BTS-330K	
R12	47K			BTS-47K	
R13	1000Ω		3504923	BTS-1000	
R14	10K		3408923	BTS-10K	
R15	5600Ω			BTS-5600	
R16	330Ω		3510923		
R17	330Ω		3510923		
R18	3.3Meg		3513923	BTS-3.3Meg	
R19	27K		3408923		
R20	1000Ω		3504923		
R21	5600Ω		3407124	BTS-5600	
R22	470Ω		3504923	BTS-470	
R23	47Ω		3401723	BTS-47	
R24	33K		3408923	BTS-33K	
R25	15K		3407723	BTS-15K	
R26	470Ω		3504123	BTS-470	
R27	180Ω		3403123	BTS-180	
R28	15K		3407723	BTS-15K	
R29	470Ω		3504123	BTS-470	
R30	180Ω		3403123	BTS-180	
R31	4700Ω			BTS-4700	
R32	470K		3811323	BTS-470K	
R33	10K		3407323	BTS-10K	
R34	5600Ω	2	3917523	BTS-5600	
R35	15K		3407723	BTS-15K	
R36	150K		3410123	BTS-150K	
R37	27K		3408323	BTS-27K	
R38	33K		3408123	BTS-33K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON Part No	IRC Part No.	
R39	15Meg		3514923	BTS-15Meg	
R40	10K		3407923	BTS-10K	
R41	470Ω		3504923	BTS-470	
R43	100K		3409723	BTS-100K	
R43	100K		3409723	BTS-100K	
R44	330K		3510523	BTS-330K	
R45	2.2Meg		3512923	BTS-2.2Meg	Note 1
R46	470K		3811323	BTS-470K	
R47	470Ω	3	7904123	BTS-470	
R48	180Ω		3403123	BTS-180	
R49	470K		3811323	BTS-470K	
R50	2.2Meg		3512923	BTS-2.2Meg	
R51	15K		3407723	BTS-15K	
R52	27K		3408323	BTS-27K	
R53	3.3Meg		3513923	BTS-3.3Meg	Note 2
R54	100Ω		3502523	BTS-100	
R55	680Ω		3504523		
R56	680Ω		3504523		
R57	1.5Meg			BTS-1.5Meg	Note 2
R58	100Ω		3502523	BTS-100	
R59	560Ω	1	3704323	BTA-560	
R60	150K		3410323	BTS-150K	
R61	100K		3409723	BTS-100K	
R62	27K		3408323	BTS-27K	
R63	10K		3407923	BTS-10K	
R64	18Ω		3400723	BTS-18	
R65	2.7Ω		3914523	BW-2.7	
R66	180Ω	1	3703723	BTA-180	
R67	5	6	3914523		
R68	1Ω		3914723		
R69	220K		3510523	BTS-220K	

Note 1. Some versions may use a 10Meg in this application.
Note 2. Not used in some versions.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		EMERSON Part No.	Hallderson Part No.	Merit Part No.	RCA Type No.	Ram Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	REPLACEMENT DATA
T1	Horiz. Output Trans.	T38120	FB41RD-* ⑤	HVC-38 ① T38121 ③	T3093 * ⑤	HO-258 ① * ⑤	FLY-16 ① * ⑤	D-50 ① * ⑤		
T2	Vert. Output Trans.	T38127 T38126 ③	Z1900 ④	A-3824 ①			26871 ①	A-108K ①		
T3A	Yoke(70°) Horiz. (30MH)	T0823 T08270 ③	DF905 ③⑤	MDF-73 ⑤	T3320 ③④⑤	Y70F20/43 ③⑤	DY-32A ③	Y-40 ③⑤		
B	Vert. (40MH)							Y-31-1 & NWS ③		

① Drill new mounting hole(s).
② Alternate part number.
③ Use 6 to 1 turns ratio.
④ Connect horizontal damping capacitor across yoke terminals #1 and #2.
⑤ Use original yoke damping network if necessary.
⑥ Cut and form a piece of .010 gauge flah paper inside the yoke itself and support with an acetate cement, to provide an insulation between the width sleeve and the yoke proper.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

CONNECTIONS	ORIGINAL TERMINAL	Hallderson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	9	9	9	2	9	9	9
	7	7	7	7	1	7	7	7
	6	7	7	7	6	7	7	7
	2	NC See Note ⑦	NC See Note ⑦	NC See Note ⑦	4	NC See Note ⑦	NC See Note ⑦	NC See Note ⑦
	1	1	1	1	7	1	1	1
Special Notes		⑦	⑦	⑦		⑦	⑦	⑦

⑦ Install new horizontal damping network consisting of 1000Ω resistor in series with capacitor C58 across horizontal yoke terminals #1 and #2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON Part No.	Hallderson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	
T4	2000Ω	3-4Ω	T34122	Z1101 ①	A-3025 ①	A-3332 ①	26258	S-12X ①	① Use original channel mounting frame.

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.		EMERSON Part No.	QUAM Part No.	
SP1	6"	PM	3-4Ω		180140	8A1	① Alternate speaker used in some versions.
	4"	PM	3-4Ω		180111 ①	4A07	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		EMERSON Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	
L1	47.25MC Trap	708313	20-1049 *		6235 *	
L2	1st. Video IF	T30344				Includes Cap.
L3A	2nd. Video IF	T30341				
B	1st. Sound IF					
L4A	3rd. Video IF	T30199				
B	2nd. Sound IF					
L5	4th. Video IF	T30347	17-4533 *	TV-130 *	6319 *	
L6	RF Choke	708034	19-1004		6610	6.8 Microhenries
						IRC Part #CLA
L7	Series Peaking Coil	708300	19-1003		6808	4.6 Microhenries
L8	Shunt Peaking Coil	708274	19-3660		6148	680 Microhenries
L9	Series Peaking Coil	708273	19-3300	TV-180	6332	330 Microhenries
L10	Shunt Peaking Coil	708374	19-3680		6148	680 Microhenries
L11	RF Choke	708371	19-1003		6808	4.6 Microhenries
L12	Sound Discriminator	708376	17-3490			
L13	RF Choke		19-1005		6812	10 Microhenries. IRC Part # CL-1 Note 1

Note 1. Not used in some versions.
* Drill new mounting hole.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI	SEC	EMERSON Part No	MEISSNER Part No	MERIT Part No	MILLER Part No	RCA TYPE No	Ram Part No	Thordarson Part No	
L14	120Ω		718102							Tapped @ 90Ω
L15	27Ω		708275							

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					NOTES
	TOTAL DIRECT CURRENT	D C RESISTANCE	INDUCTANCE (@ CURRENT 1000 ℃)	EMERSON Part No	Halderson Part No	Merit Part No	Stancor Part No	Thordarson Part No	Triad Part No
L16	245A	23Ω	T37019	C904 ①	C-3996 ①	C-2328 ①	26C41 ①	C-24X	

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	EMERSON Part No	REPLACEMENT DATA
K1	Horiz. AFC	Module	T50001J	
K2	Horiz. Osc.	Module	T50003K	
K3	Vert. Unit.	Module	T50008L	
K4	Sync	Module	T50000I	
K5	Ant. Isolation	470MMF, .3-1Meg		Centralab RC-471
K6	Ant. Isolation	470MMF, .3-1Meg		Centralab RC-471

RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA					NOTES
	CURRENT (Measured)		EMERSON Part No.	FEDERAL Part No.	GENERAL ELECTRIC Part No.	INTERNATIONAL Part No.	MALLORY Part No.	SARKES TARZIAN Part No.
M1	285A		617047 ①	1023A ①	1N1007 ②	RS3508L ①	6S350 ①	350A ①

① Selenium type. ② Germanium

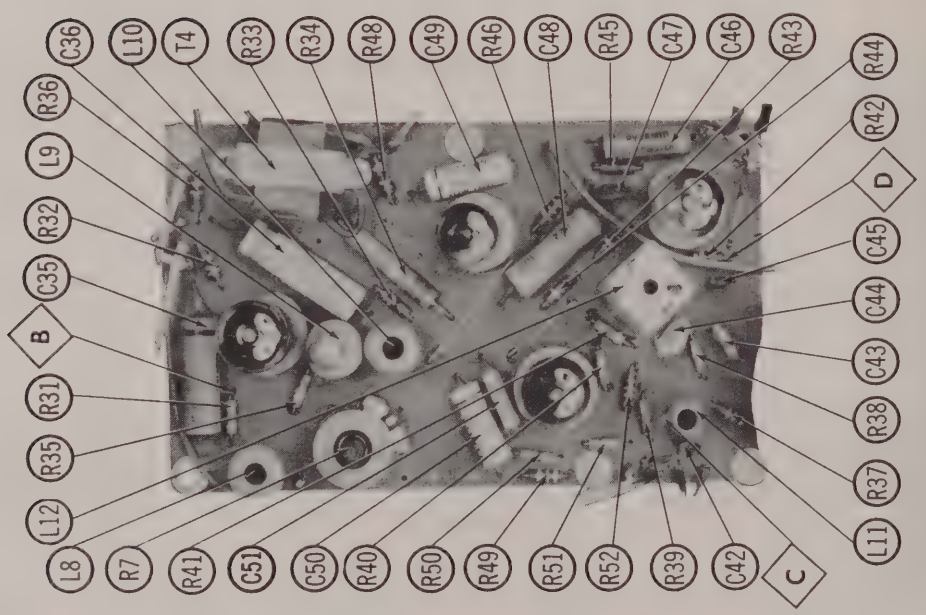
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			EMERSON Part No.		LITTELFUSE Part No.		BUSS Part No	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	M	1A 125V 3/8	809014		313001 (W 1A)	340031	M 1	HM 3/4 to 1 1/4

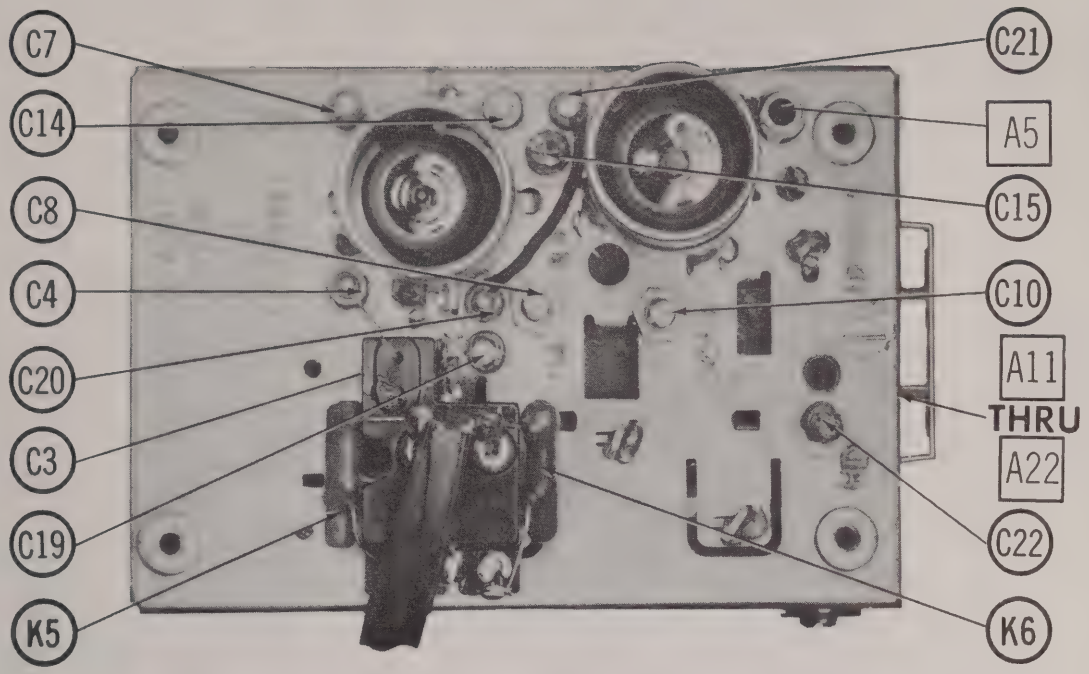
PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

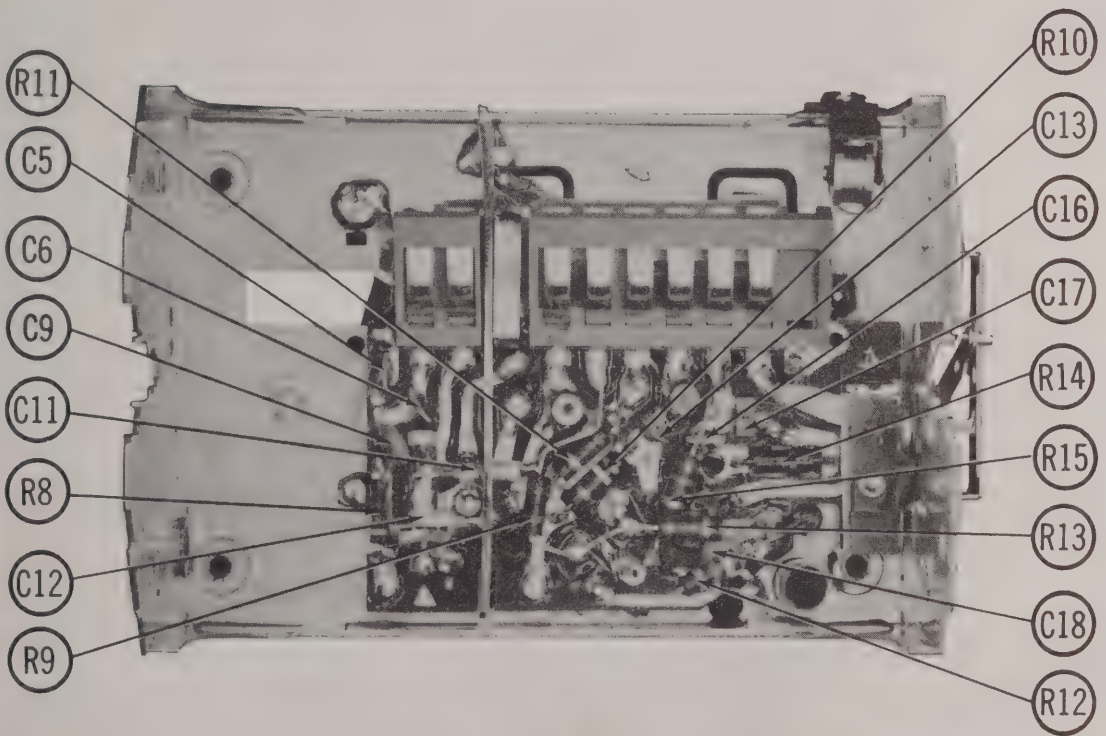
ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3	Tuner	470936	VHF, Used in Ch. 120306EM
	Tuner	470881	UHF/VHF, Used in Ch. 120307RM
	Tuner	470926	VHF, Used in Ch. 120306CM
M4	Centering Device	708277	
M5	Ion Trap	708235	
M6	Barkhausen Eliminator	708234	
	Timer	470948	Used in Models 1210, 1211
	Printed Board	630174	Video Amp. and sound
	Printed Board	630183	Horiz. Osc.
	Safety Glass	520243	
	Mask	460697	
	Knob	460691C	UHF Channel Selector, Models 1201, 3, 7, 9, 11
	Knob	460691A	UHF Channel Selector, Model 1205
	Knob	460690C	VHF Channel Selector, Models 1201, 3, 7, 9, 11
	Knob	450227	VHF Channel Selector, Model 1204
	Knob	450227A	VHF Channel Selector, Models 1200, 2, 6, 8, 10
	Knob	460690A	VHF Channel Selector, Model 1205
	Knob	460692	Fine tuning, Models 1201, 3, 5, 7, 9, 11
	Knob	460234A	Fine tuning, Models 1200, 2, 6, 8, 10
	Knob	460693B	On-off-volume, Models 1201, 3, 7, 9, 11
	Knob	450228	On-off-volume, Model 1204
	Knob	450228A	On-off-volume, Models 1200, 2, 6, 8, 10
	Knob	460693A	On-off-volume, Model 1205
	Knob	460694B	Contrast, Models 1201, 3, 7, 9, 11
	Knob	460233A	Contrast, Models 1200, 2, 6, 8, 10
	Knob	460694A	Contrast, Model 1205
	Knob	460713	Control 3 used, Models 1204, 5
	Cabinet	140769	Mahogany, Models 1200, 1
	Cabinet	140769A	Blonde, Models 1200, 1
	Cabinet	140769B	Ebony, Models 1200, 1
	Cabinet	140803	Mahogany, Models 1202, 3
	Cabinet	140803A	Blonde, Models 1202, 3
	Cabinet	140803B	Walnut, Models 1202, 3
	Cabinet	140772	Mahogany, Models 1204, 5
	Cabinet	140772A	Blonde, Models 1204, 5
	Cabinet	140772B	Walnut, Models 1204, 5
	Cabinet	140776	Mahogany, Models 1206, 7
	Cabinet	140776A	Blonde, Models 1206, 7
	Cabinet	140776B	Walnut, Models 1206, 7
	Cabinet	140775	Mahogany, Models 1208, 9
	Cabinet	140775A	Blonde, Models 1208, 9
	Cabinet	140775B	Walnut, Models 1208, 9
	Cabinet	140798	Mahogany, Models 1210, 11
	Cabinet	140798A	Blonde, Models 1210, 11
	Cabinet	140798B	Walnut, Models 1210, 11



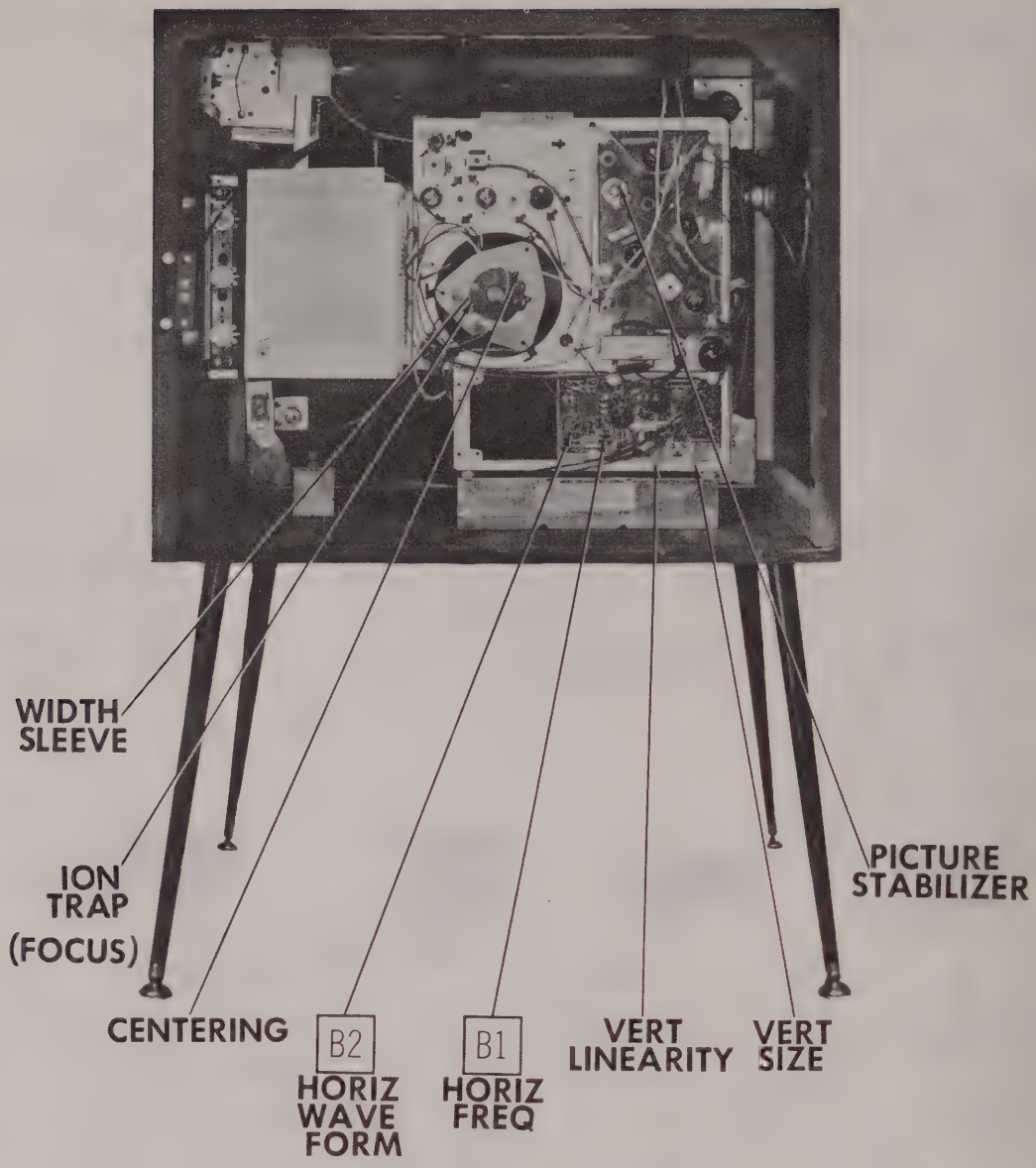
VIDEO OUTPUT & SOUND PRINTED BOARD



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the picture stabilizer control (R7) fully clockwise.

1. Turn the horizontal hold control fully clockwise.
2. Connect a short jumper across L15.
3. Adjust the horizontal frequency slug (B1) to the center of the range in which the picture synchronizes horizontally.
4. Remove the short from L15.
5. Connect the scope to point (E). Low side to chassis.
6. Adjust the horizontal waveform slug (B2) until the broad and narrow peaks are of equal amplitude as shown in Fig. 3.
7. Remove the scope. The picture should be in sync and remain in synchronization through the entire range of the horizontal hold control.

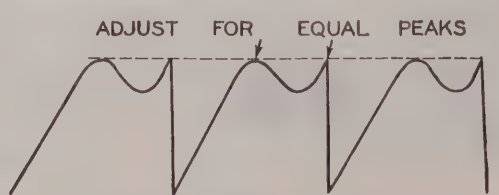


FIG. 3

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

FIRESTONE MODEL
4-C-31 (Code 1-6-4PL)

FIRESTONE MODEL
4-C-31 (Code 1-6-4PL)

TRADE NAME	Firestone Model 4-C-31 (Code 1-6-4PL)
SUPPLIER	Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, Ohio
TYPE SET	Battery Operated Portable AM Receiver
TUBES (Four)	Types 1R5 Converter, 1U4 IF Amplifier, 1U5 Det.-AVC-AF Amp., 3V4 Output

POWER SUPPLY 1.5 Volts "A" Supply & 67.5 Volts "B" Supply RATING 250MA @ 1.5 Volts DC & 10MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST 535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	1620KC	"	"	A5	
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Adjust for maximum output. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	1R5	
V2	IF Amplifier	1U4	
V3	Det. -AVC-AF Amplifier	1U5	
V4	Output	3V4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	FIRESTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	70	581007	SRE150V10	BBR10-150	TC42	TD-10-150	FM-1508	TVA-1406

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200		BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C3	50									
C4	10000			BPD-01	DD-103	K082	ED-01	DC511	5HK-S1	
C5	2000			BPD-002	DD-202	K072	ED-002	DC522	5HK-D2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	1Meg	½	368002					Volume

RESISTORS

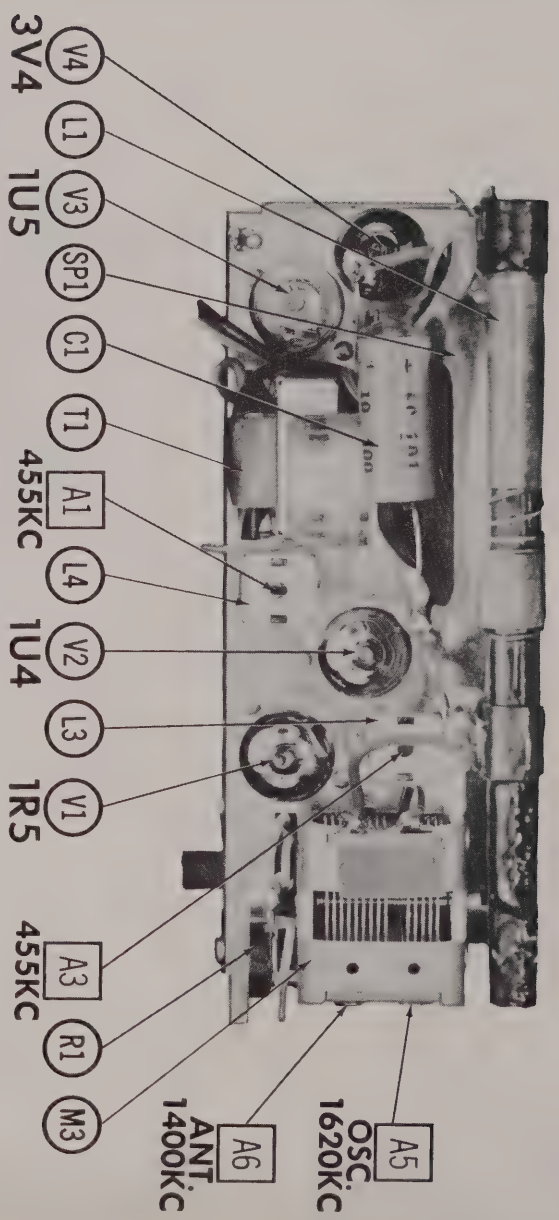
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	FIRESTONE PART No.	IRC PART No.	
R2	100K			BTS-100K	
R3	15K			BTS-15K	
R4	2.2Meg			BTS-2.2Meg	
R5	390Ω			BTR-390	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	FIRESTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8900Ω	3-4Ω	430080						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	FIRESTONE PART No.	QUAM PART No.		
SP1	4"	PM	3-4Ω	404004	4A07		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		FIRESTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	434017				
L2	Osc. Coil	450039	14-1074			
L3	Input IF	450013	16-6800	BC-358	10-C1	
L4	Output IF	450016	16-6801	BC-359	10-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	FIRESTONE PART No.	REPLACEMENT DATA	
K1	Detector-Audio Circuit	4.7Meg, 1Meg, 3.3Meg, 10Meg, 2000MMF, 150MMF, 10000MMF, 150MMF, 5000MMF	420007	Aerovox Centralab Sprague	PA-521 PC-165 DP-1

BATTERIES

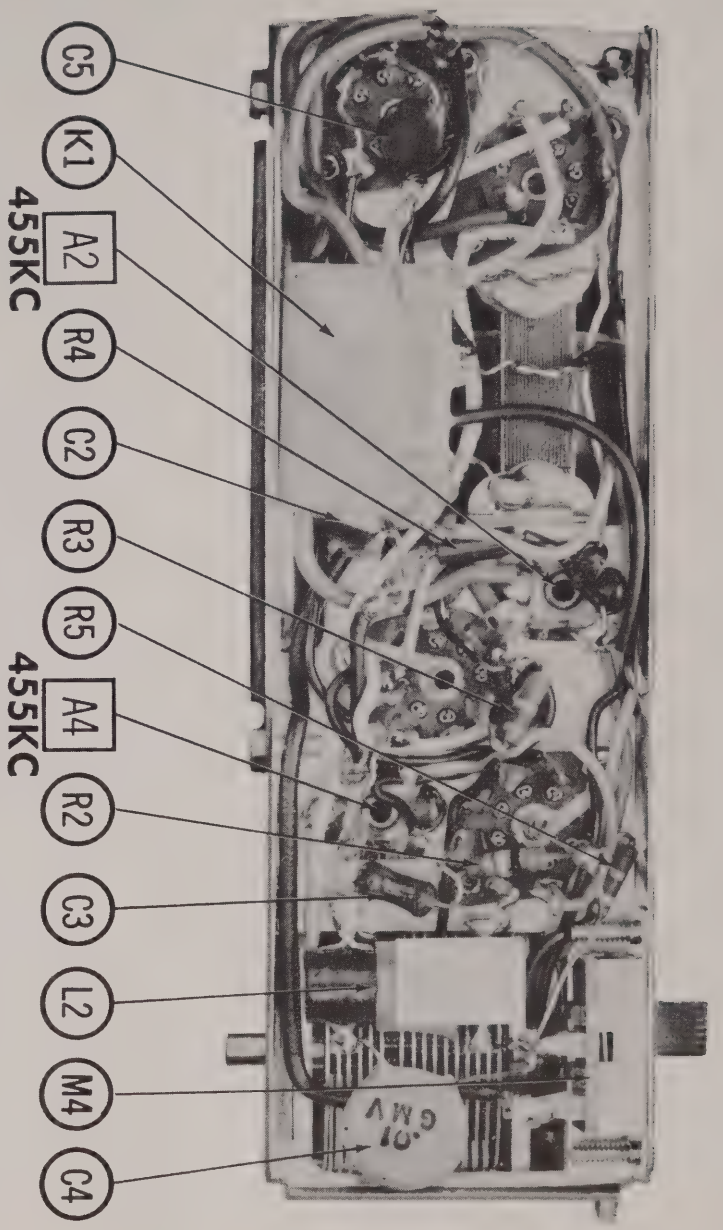
ITEM No.	VOLTAGE	FIRESTONE PART No.	REPLACEMENT DATA								
			BURGESS			EVEREADY			MALLORY		
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	"A"	"B"	"A-B"
M1	1½V		#1 *			635*			M-14 *		
M2	67½V	4-D-135		P45			477			M-211	

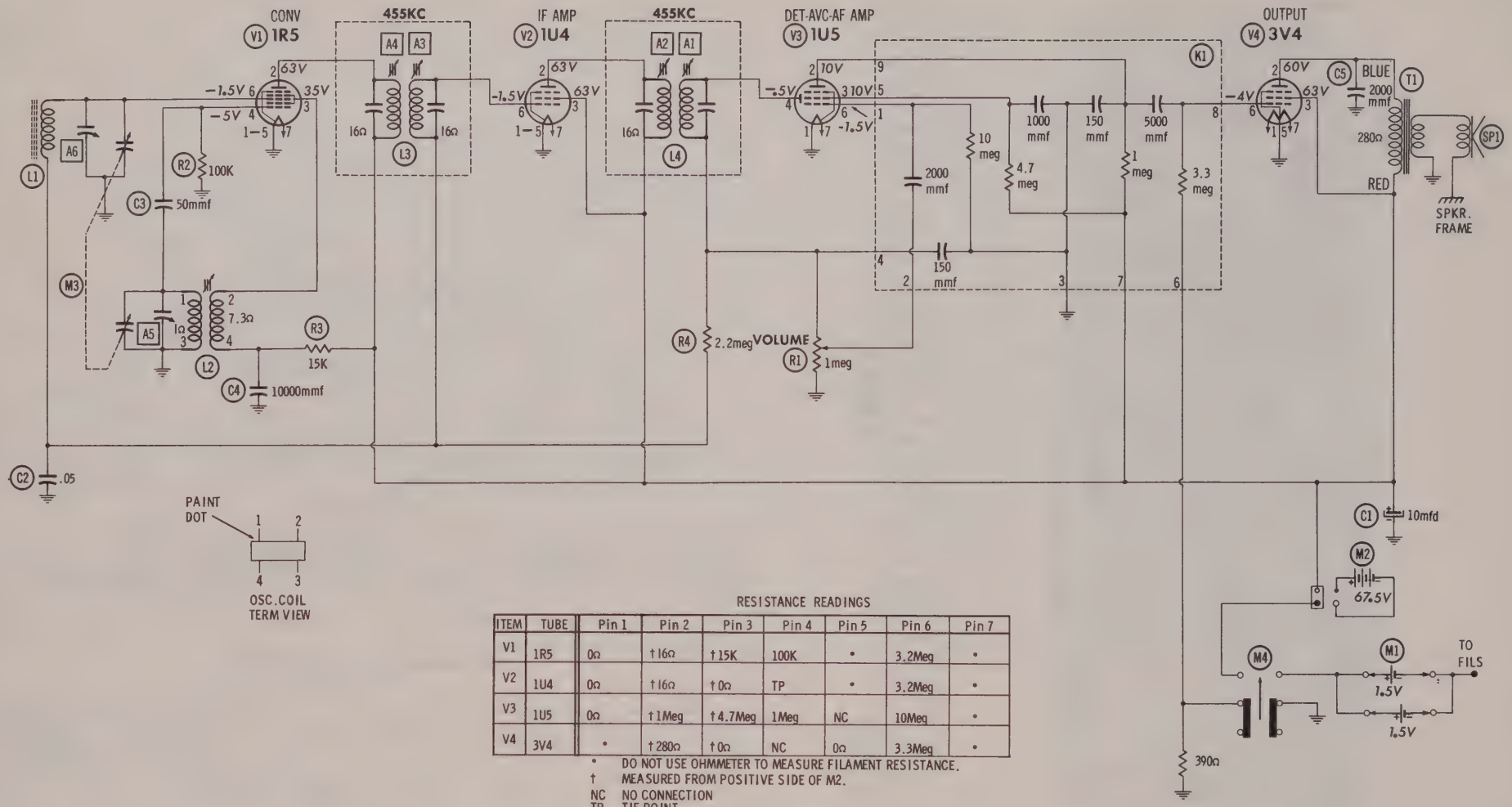
* Requires 2 in parallel.

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M3	Tuning Cap.	590026	2 Gang (11-240MMF, 15-115MMF)
M4	Switch	370017	On-off (DPST Slide Type)
	Knob	270603	Tuning
	Knob	270703	Volume
	Case	270017	British Tan

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	1R5	0Ω	†16Ω	†15K	100K	•	3.2Meg	•
V2	1U4	0Ω	†16Ω	†0Ω	TP	•	3.2Meg	•
V3	1U5	0Ω	†1Meg	†4.7Meg	1Meg	NC	10Meg	•
V4	3V4	•	†280Ω	†0Ω	NC	0Ω	3.3Meg	•

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
† MEASURED FROM POSITIVE SIDE OF M2.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MAGNAVOX Ch. V19-01AA, V19-02AA, U19-01AA, U19-02AA

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3924 MEADE ST.
DENVER, COLORADO

MAGNAVOX Ch. V19-01AA, V19-02AA, U19-01AA, U19-02AA

MAGNAVOX CHASSIS V19-02AA

TRADE NAME	Magnavox Chassis U19-01AA, U19-02AA, V19-01AA, V19-02AA
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Television
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle — RATING 120 Watts, 1.1 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

MAGNAVOX Ch. V19-01AA, V19-02AA, U19-01AA, U19-02AA

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DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove the 2 side trim strips by sliding off toward the back.

2. Remove 6 metal screws and the rear cover.

3. Remove the bolt holding the handle at the front, the metal screw in the center of the handle and the handle.

4. Remove 7 push-on type control knobs from the top.

5. Remove speaker leads, picture tube socket, ion trap, yoke clamp, yoke and HV lead.

6. Remove 4 metal screws and remove the cabinet top.

7. Remove 4 chassis bolts from the bottom and remove the chassis.

8. Remove 4 speaker nuts and the speaker.

CHASSIS
U19-01AA, U19-02AA, V19-01AA, V19-02AA

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physically contacting chassis.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF oscillator it is necessary to remove the chassis from the cabinet. (See disassembly instructions).

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube and safety glass cleaning, see steps 1, 2 and 3 of "Disassembly Instructions". Remove 1 metal screw from the bottom of the front and remove the entire front of cabinet.

FOCUS

The focus may be varied by the position of a wire from pin 6 of the picture tube to pin 36 or 38 on the printed board. Adjust Ion trap for the best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. For location, see tube placement chart.

FUSES

A 5Ω fusible resistor R73 is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

MAGNAVOX Ch. V19-01AA, V19-02AA, U19-01AA, U19-02AA

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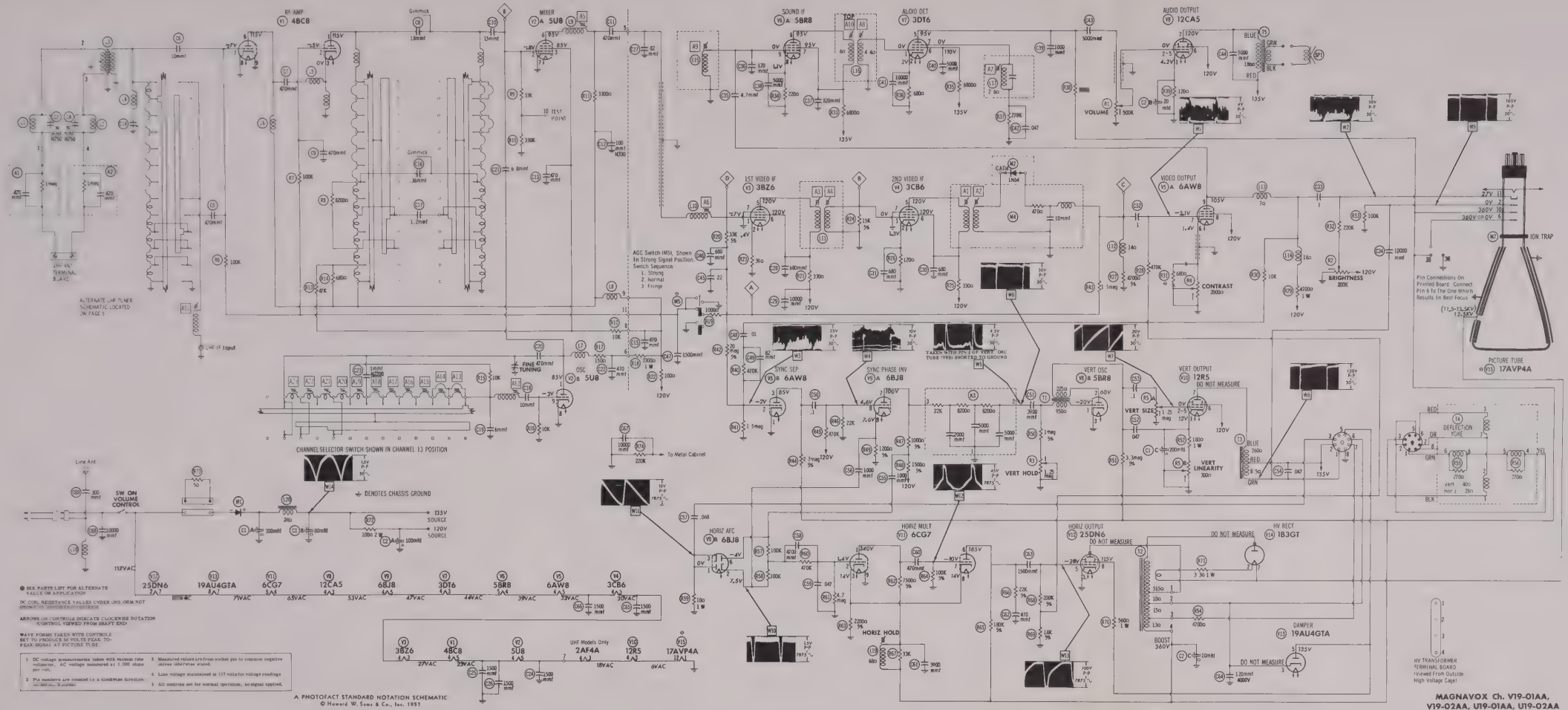

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION CONTROL VIEWED FROM SHAFT END

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MAGNAVOX Ch. V19-01AA, V19-02AA, U19-01AA, U19-02AA

TUBE PLACEMENT CHART

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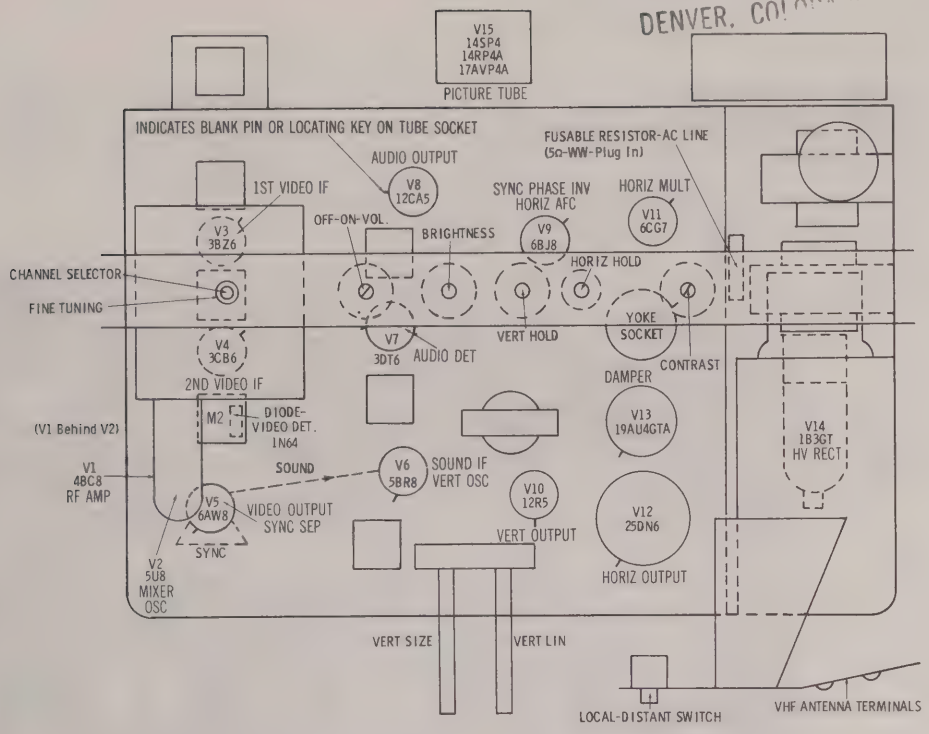


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

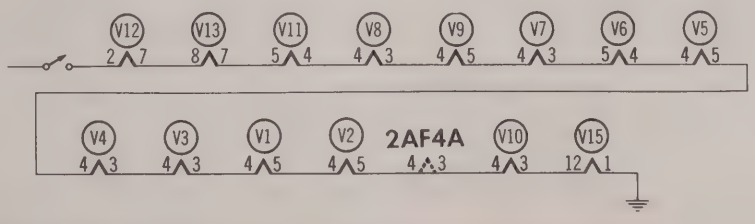
POWER SUPPLY FAILURE
No raster, no sound - Fusible Resistor (R73), Rectifier (M1)

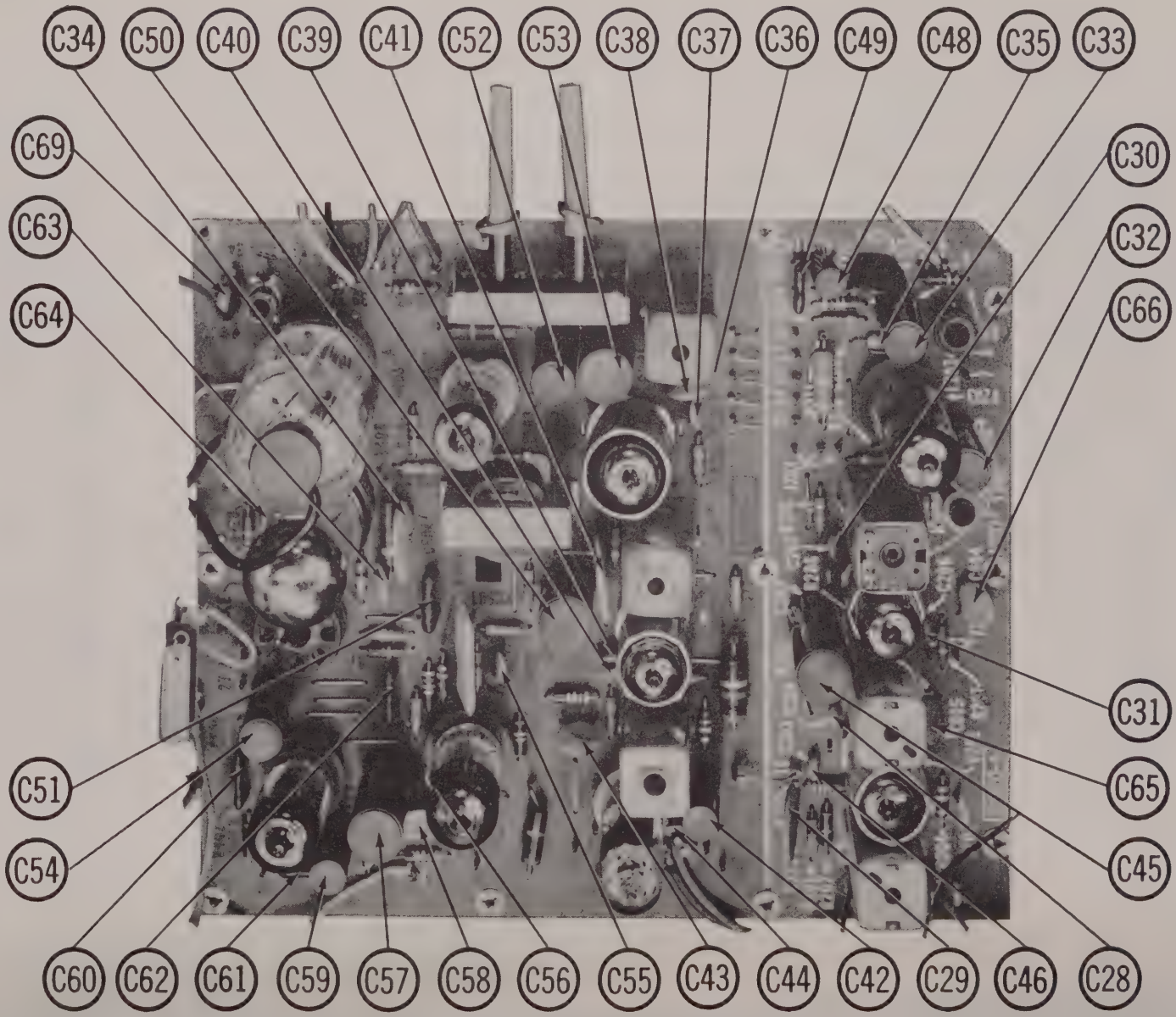
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, Diode (M2), V5
No pic, no sound, has snow - V1, V2
No pic, has sound, has raster - V5, V15
Has pic, no sound - V6, V7, V8

SYNC FAILURE
No vert. sync - V5, V9
No horiz. sync - V5, V9
No vert. or horiz. sync - V5, V9

SWEEP FAILURE
No raster, has sound - V9, V11, V12, V13, V14, V15
No vertical deflection - V6, V10
Poor vert. linearity or foldover - V6, V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, M1
Vert. off freq. - V6
Horiz. off freq. - V11

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative (See circuit below).





CAPACITOR IDENTIFICATION

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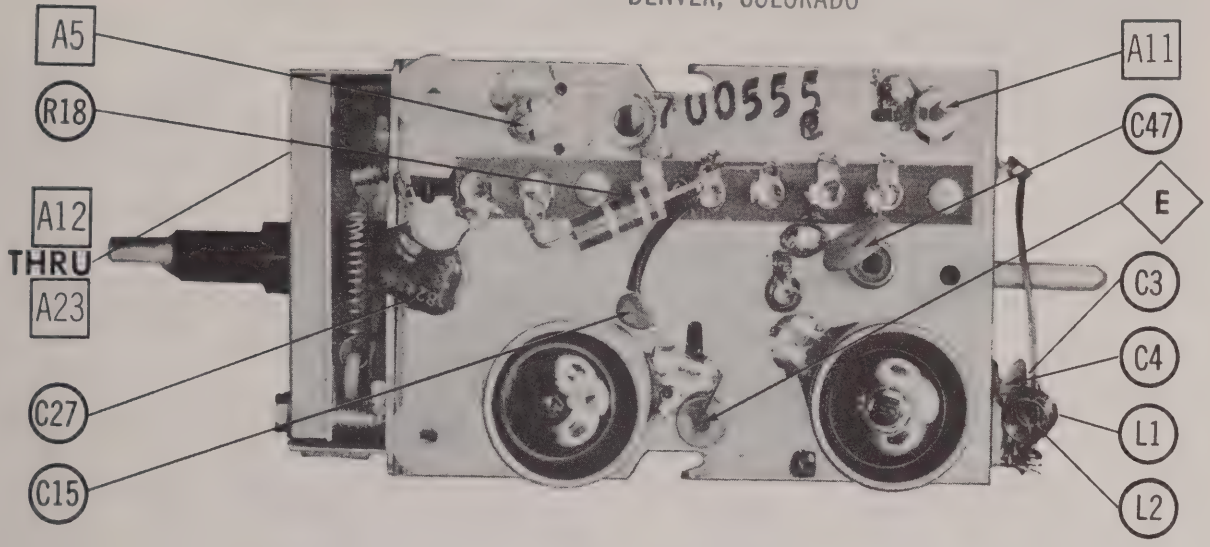
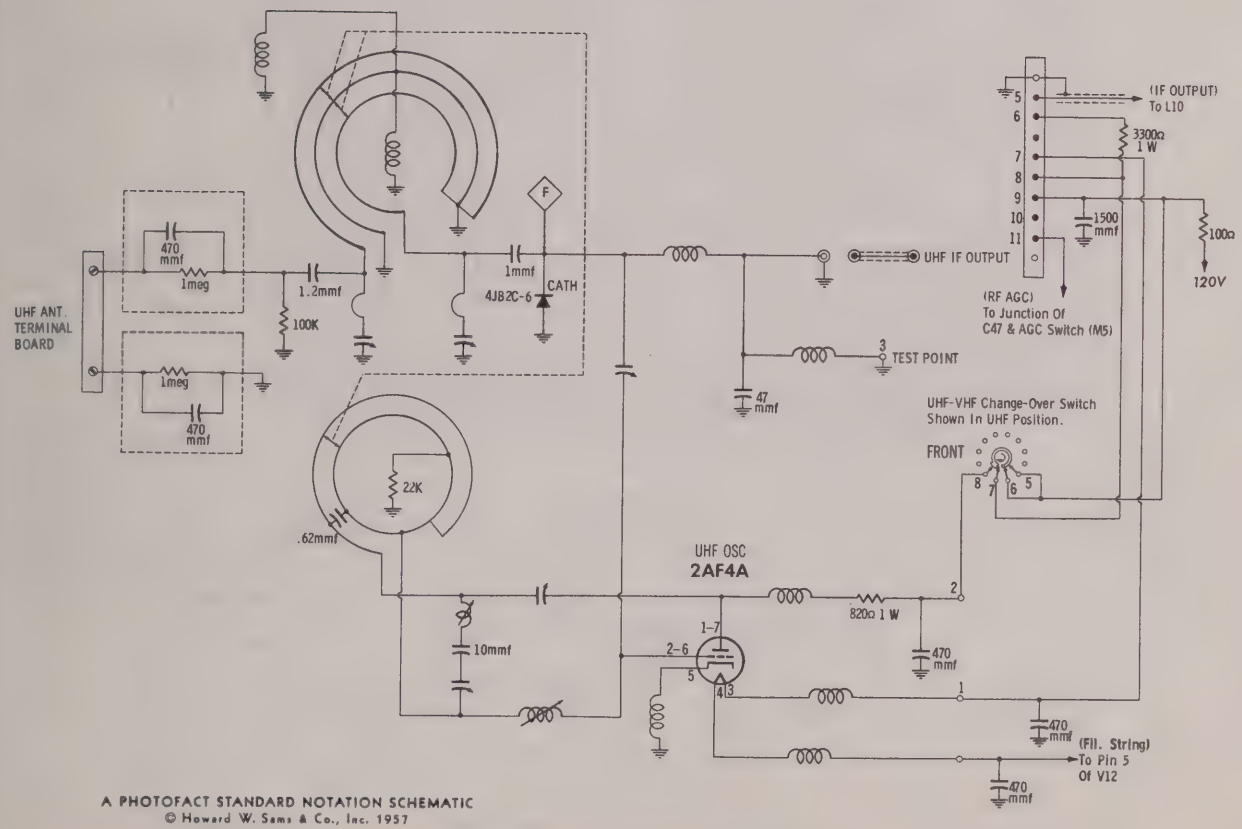


RF TUNER - TOP VIEW



ALTERNATE UHF TUNER SCHEMATIC

SET 360 FOLDER 6

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Set "Local-Distant" switch to "Local" position.
Set contrast control fully counter clockwise.
Connect the negative lead of a 3 volts bias supply to point (A). Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to point (B). Low side to chassis.	43MC (10MC Swp)	42.75MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10K to point (C). Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 1 with markers as indicated. Adjust A1 for maximum gain between markers. Adjust A2 for proper bandwidth.
2.	"	High side to point (D). Low side to chassis.	"	"	"	"	A3, A4	Adjust input to provide 3 volts peak to peak. Adjust for response similar to Fig. 2 with markers as indicated.
3.	"	High side to point (E). Low side to chassis.	"	42.75MC 45.0MC 45.75MC	12	"	A5, A6	Adjust A5 for maximum gain while placing 45.75MC marker at 50% on curve as in Fig. 3. Adjust A6 for maximum gain and symmetry with markers as indicated in Fig. 3. If necessary, retouch A1 thru A4 for desired response.

UHF IF ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	1000Ω Carbon Resistor	High side to point (F). Low side to tuner chassis.	43MC (10MC Swp)	42.75MC 45.0MC 45.75MC	UHF	Vert. Amp. thru 10K to point (C). Low side to chassis.	All	Adjust for maximum gain and MINIMUM tilt.

SOUND IF ALIGNMENT

1. Tune in a strong TV signal and adjust A7 for maximum sound output with MINIMUM distortion.
2. Reduce the signal strength, by using an attenuation pad, so that with the volume control set fully clockwise, the sound is just audible. Adjust A8 for MINIMUM noise and clearest sound. (If no attenuator is available, disconnect antenna and place leads in vicinity of antenna terminals.
3. Using same weak signal, adjust A9 and A10 for MINIMUM noise and clearest sound.
4. Reduce the signal further until noise is present and retouch A10 for MINIMUM noise and clearest sound.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscillos cope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (C). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

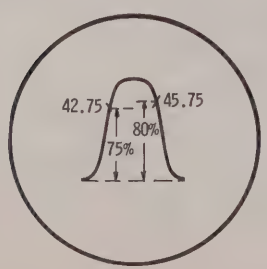


FIG. 1

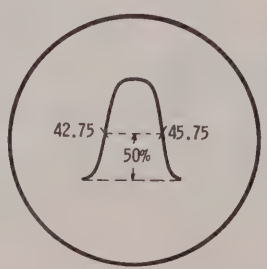


FIG. 2

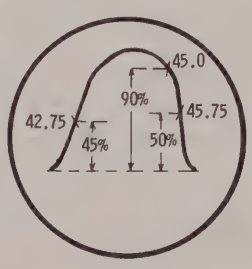


FIG. 3

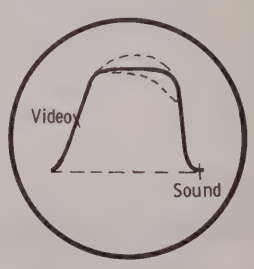
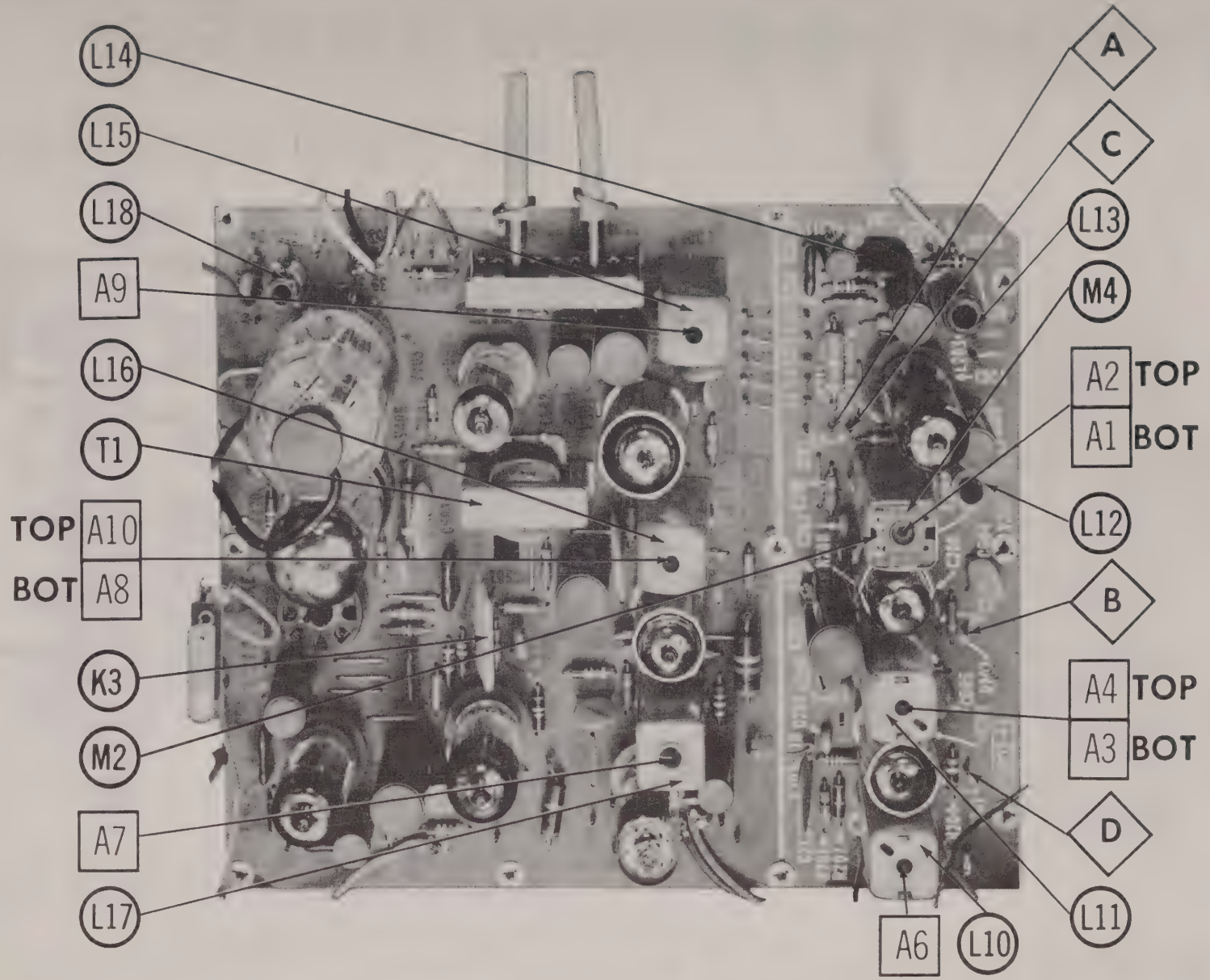
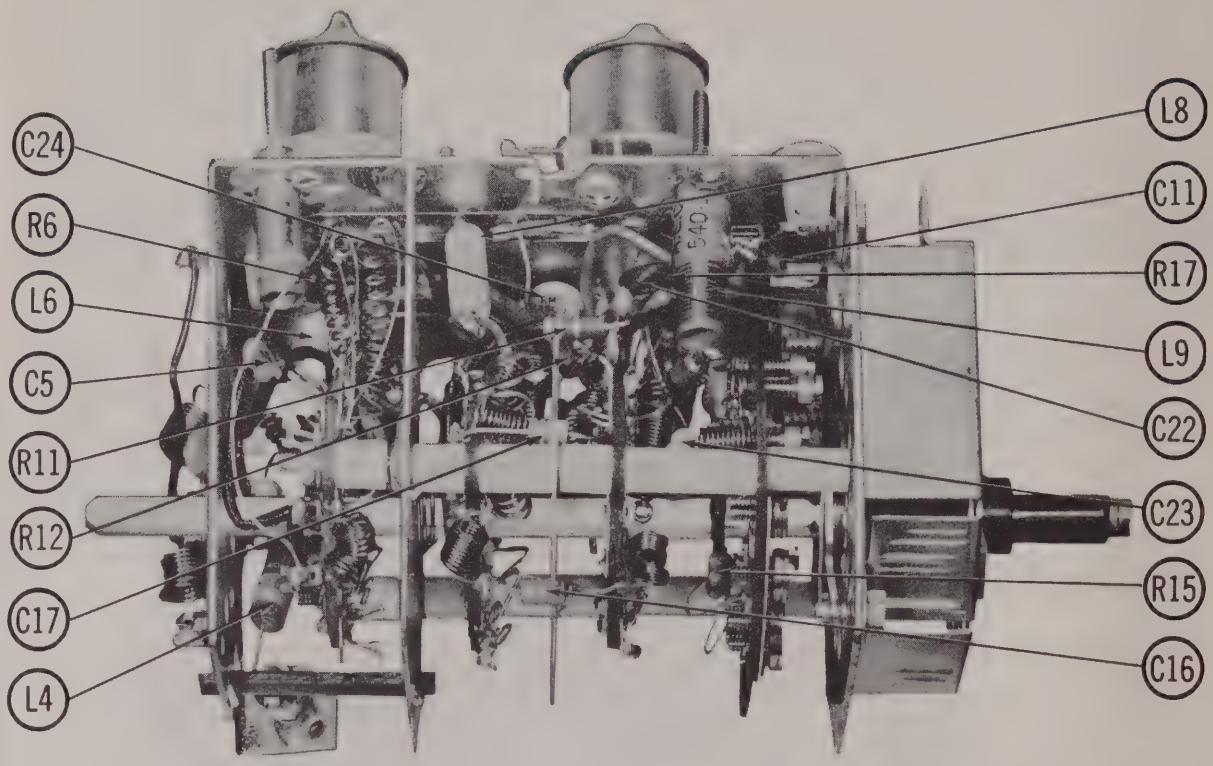


FIG. 4

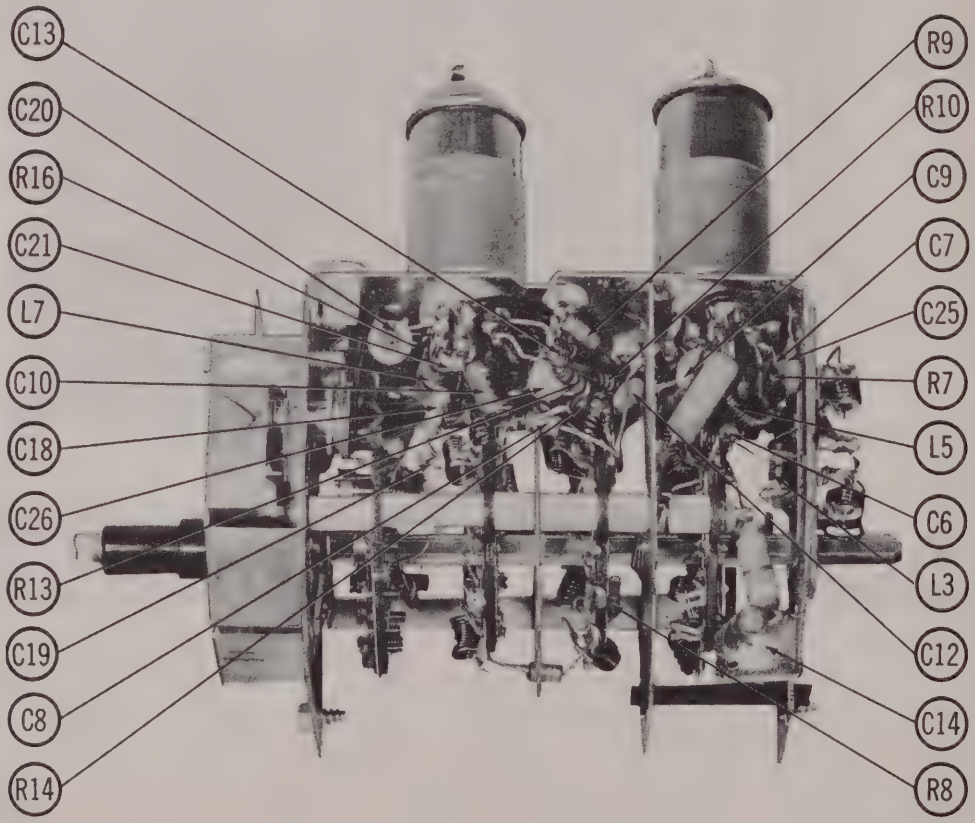


TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

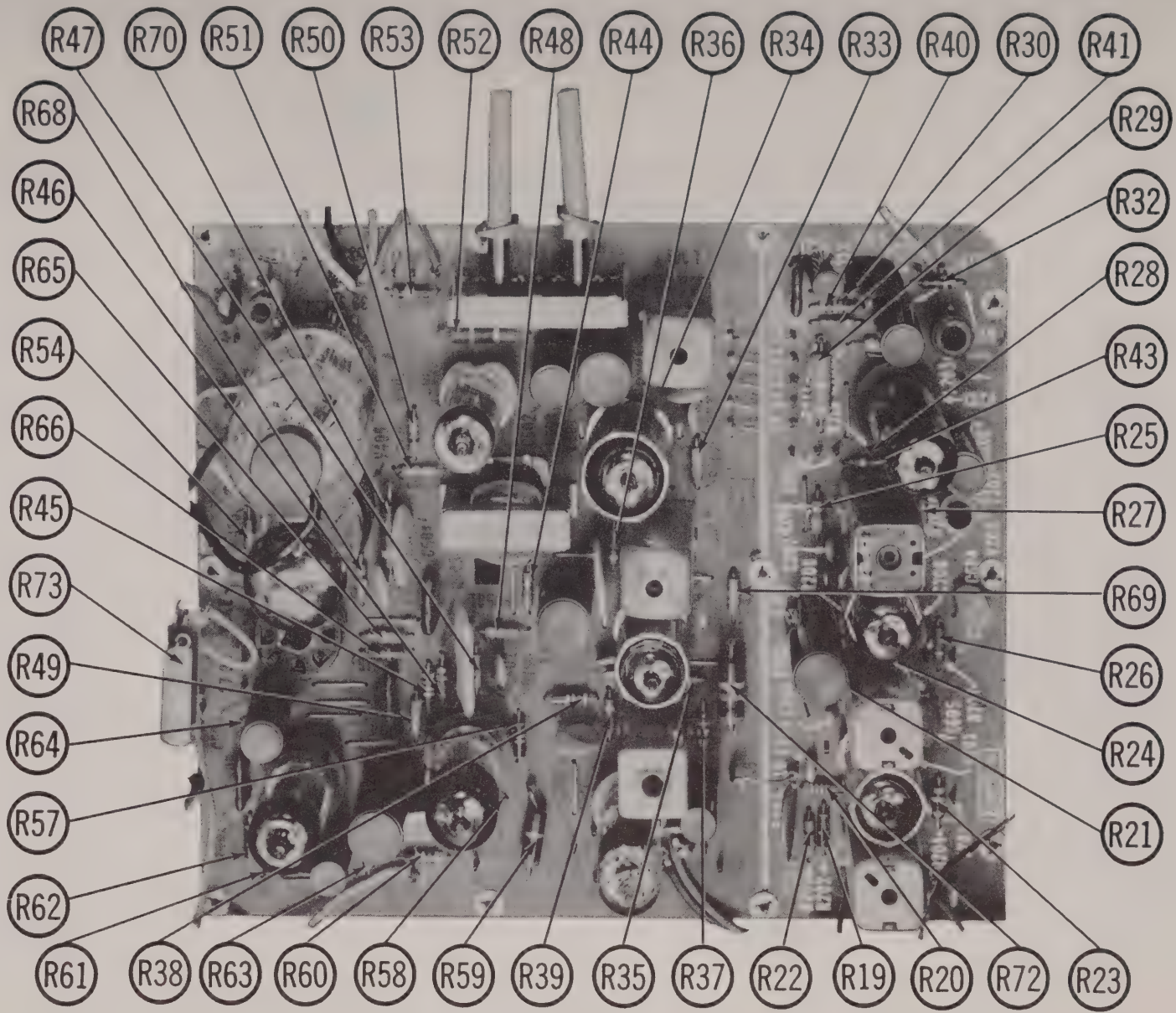
MAGNAVOX Ch. V19-01AA, V19-02AA,
U19-01AA, U19-02AA



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



RESISTOR IDENTIFICATION

MAGNAVOX Ch. V19-01AA, V19-02AA,
U19-01AA, U19-02AA

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BC8	†225Ω	1.6Meg	2.5Ω	6Ω	5.5Ω	†225Ω	1.6Meg	0Ω	0Ω
V2	5U8	†3600Ω	360K	†9K	5.5Ω	4Ω	†3500Ω	0Ω	0Ω	10K
V3	3BZ6	1.5Meg	39Ω	6Ω	7Ω	†450Ω	†450Ω	0Ω		
V4	6CB6	.1Ω	120Ω	7Ω	7.5Ω	†450Ω	†450Ω	0Ω		
V5	6AW8	0Ω	1.5Meg	‡2.7Meg	9Ω	7.5Ω	•15Ω	470K	†125Ω	†4800Ω
V6	5BR8	•1.5Meg	‡3.3Meg	0Ω	9Ω	10Ω	†6800Ω	†6800Ω	220Ω	.6Ω
V7	3DT6	4.4Ω	680Ω	10Ω	11Ω	‡470K	†6800Ω	270K		
V8	12CA5	120Ω	50K	12.5Ω	15Ω	50K	†125Ω	†210Ω		
V9	6BJ8	10Ω	5.3Meg	10Ω	12.5Ω	11Ω	5.3Meg	†2600Ω	18K	1200Ω
V10	12R5	•350Ω	•700K	1.5Ω	4Ω	•700K	†125Ω	†280Ω		
V11	6CG7	‡7500Ω	4.7Meg	2200Ω	15Ω	16.5Ω	‡180K	100K	2200Ω	0Ω
V12	25DN6	TP	25Ω	0Ω	NC	220K	NC	20Ω	†585Ω	TOP CAP ‡10Ω
V13	19AU4GTA	NC	NC	¶	NC	†25Ω	NC	16.5Ω	20Ω	
V14	1B3GT	PINS 1 THRU 8 HAVE INF RESISTANCE								TOP CAP ‡525Ω
V15	17AVP4A	0Ω	100K	PIN 6 ‡26Ω	PIN 10 ‡26Ω	PIN 11 240K	PIN 12 1.5Ω			

TP TIE POINT
NC NO CONNECTION
† MEASURED FROM OUTPUT OF M1
‡ MEASURED FROM PIN 3 OF V13
• THIS READING WILL VARY: CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

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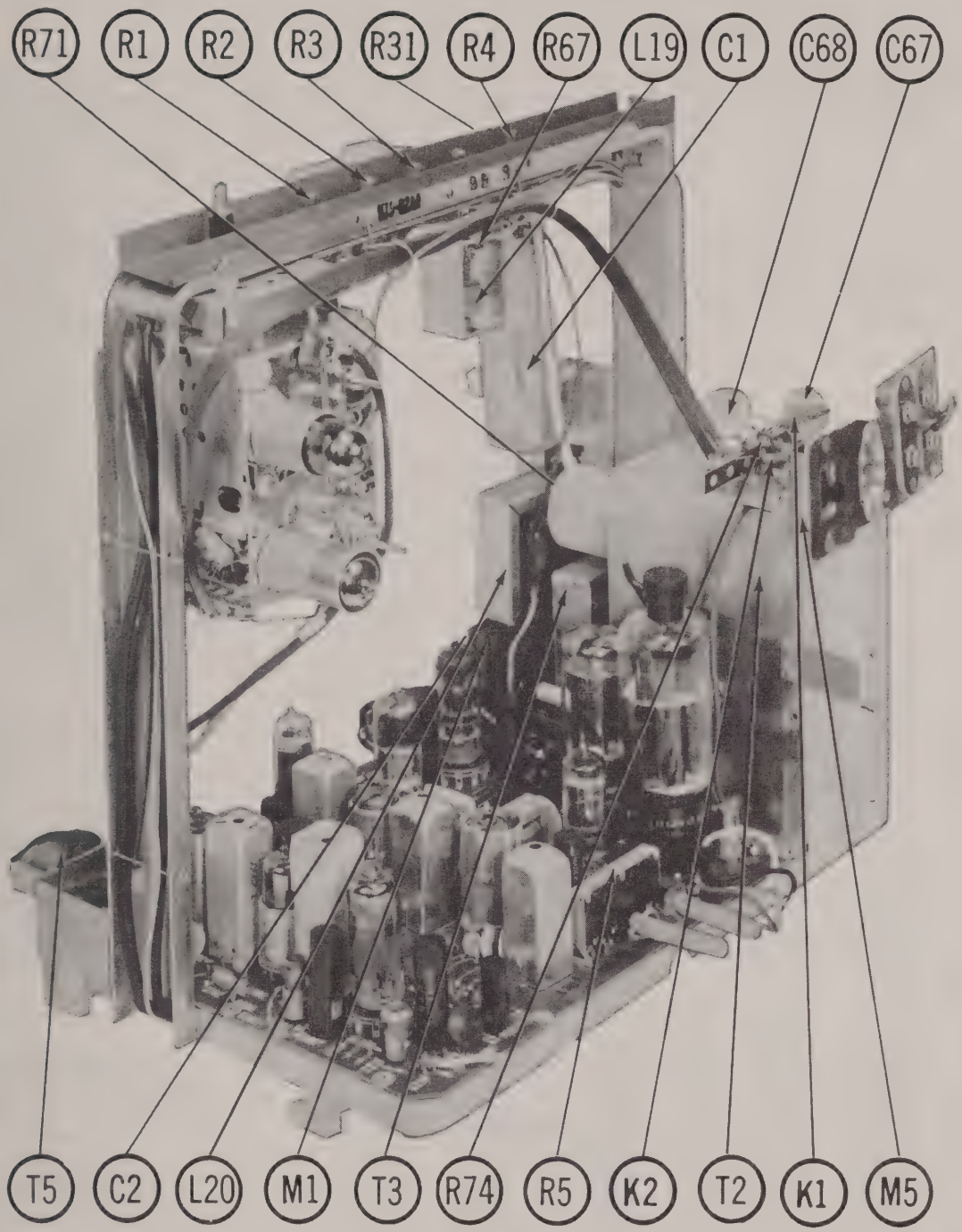


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	R F Amplifier	4BC8	
V2	Mixer-Oscillator	6U8	
V3	1st Video IF Amp	3BZ6	
V4	2nd Video IF Amp	3CB6	
V5	Video Output-Sync Sep	6AW8	
V6	Sound IF Amp -Vert Osc	5BR8	
V7	Audio Det	2DT8	
V8	Audio Output	12CA5	

ITEM No	USE	TYPE	NOTES
V9	Sync Phase Inverter-Horiz AFC	6BJ8	
V10	Vert Output	12B3	
V11	Horiz Multi	6CQ7	
V12	Horiz Output	25DN8	
V13	Damper	19AU4GTA	
V14	HV Rectifier	1B3GT	

PICTURE TUBE

ITEM No	REPLACEMENT DATA: MAGNAVOX PART No.	RS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V15	17AVP4A	17AVP4A ②	17AVP4 ②	17AVP4A ② 17AVP4 17AVP4A, 17AVP4A1	① Silver screen "86" ② Aluminized
	14RP4	14RP4			
	14RP4A	14RP4A ①		14RP4A ① 14RP4	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	4300	150	270021-53	AFH83-83-95		FP411 ① TC492			R2370 †
B	80	150							
C	4400	50							
C2A	4100	350	270023-25	AFH3-188	C1450	WQ775 TC48	TMT-151	T-770	TVL-3903
B	30	50							
C	40	450							

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING: CAP	VOLT	REPLACEMENT DATA: MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	39		250175-40	N750-41 39	TCN-39	C10QB1U	TCT-39			N750
C4	39		250175-40	N750-41 39	TCN-39	C10QB1U	TCT-39			N750
C5	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C6	10		250125-147	NP0-81 10	DB-100	L10QB	ED-10	UC-546	SGA-Q	
C7	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C8	18		250128-4							
C9	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C10	15		250307-5	NP0-81 15	TCZ-15	L15QB	ED-15	UC-5425	SGA-Q25	
C11	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C12	100		250175-24		TCA-100					N330
C13	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C14			250186-5							
C15	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C16	36		250126-5							
C17	1.2		250221-128	NP0-81 1	TCZ-1					
C18	10		250068-136	NI 10	DB-100	L10QB	ED-10	ET-541	SGA-Q	
C19	8		250068-143							
C20	470		250218-15	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C21	6.8		250221-121	NP0-81 6.8	TCZ-6R8	CD19BC	TCC-6.8	ET-5548	SGA-T68	
C22	470		250175-8	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C23	1		250068-144							N1500
C24	1500		250175-10	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	SHK-D15	
C25	1500		250175-10	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	SHK-D15	
C26	1500		250175-10	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	SHK-D15	
C27	82		250126-138	BPD-000082	DS-820	L10QB3	ED-82	UC-5482	SGA-Q82	
C28	680		250124-128	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C29	10000		250234-66	BPD-01	DD-103	BYA681	GP-10000	DC511	SHK-S1	
C30	680		250124-128	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C31	680		250124-128	BPD-00068	DD-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C32	1	200	250240-13			BC2P5		ACE401	ESE-P10	
C33	.1	200	250240-13			BC4P5		ACE401	ESE-P10	
C34	10000		250234-66	BPD-01	DD-103	BYA681	ED-01	DC511	SHK-S1	
C35	4.7		250221-133	NP0-81 4.7	TCZ-4R7	C10V47C	TCC-4.7	ET-5547	SGTCB-V47	
C36	10		250125-3	BPD-00013	DB-121	L10T1	ED-120	UC-5312	SGA-T12	
C37	820		250124-140	BPD-00082	DS-821	BYA10T82	ED-820	UC-5382	SGA-T82	
C38	5000		250125-1	BPD-005	DD-502	BYA10D5	ED-005	DC5125	SHK-D5	
C39	1000		250234-42	BPD-001	DD-102	BYA82A	ED-1000	DC521	SHK-D1	
C40	5000		250126-1	BPD-005	DD-502	BYA10D5	ED-005	DC5125	SHK-D5	
C41	5000		250124-65	BPD-005	DD-502	BYA82E	ED-01	DC511	SHK-S1	
C42	.047	200	250240-11			BC2S47J		ACE5147	ESE-S47	
C43	5000		250125-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	SHK-D5	
C44	5000		250125-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	SHK-D5	
C45	.33	300	250240-15			BC2P33J		ACE3022	ESE-P33	
C46	680		250124-128	BPD-00068	DS-681	BYA10T68	ED-680	UC-5368	SGA-T68	
C47	1500		250218-18	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	SHK-D15	
C48	.01	200	250240-11			BC2S1J		ACE501	ESE-S1	
C49	82		250129-134	BPD-000082	DS-820	L10QS3	ED-82	UC-5482	SGA-Q82	
C50	.1	400	250240-13			BC2P1J		ACE501	ESE-P10	
C51	3900		250125-468	BPD-004	DS-402	BYA10D4	ED-004	UC-5329	SHK-D39	
C52	.047	400	250242-11			BC2S47J		ACE5147	ESE-S47	
C53	.1	400	250242-13			BC2P1J		ACE501	ESE-P10	
C54	.047	600	250244-11			BC2S47J		ACE5147	ESE-S47	
C55	1000		250234-24	BPD-001	DD-103	BYA82A	ED-1000	DC521	SHK-D1	
C56	1000		250234-24	BPD-001	DD-103	BYA82A	ED-1000	DC521	SHK-D1	
C57	.068	400	250242-13			BC2S6SJ		ACE501	ESE-S68	
C58	4700		250126-158	BPD-0047	DE-472	BYA10D47	ED-0047	DC5247	SGA-D47	
C59	.047	200	250240-11			BC2S47J		ACE5147	ESE-S47	
C60	470		250125-346	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C61	3900		250125-468	BPD-004	DS-402	BYA10D4	ED-004	UC-5329	SGA-D39	
C62	470		250125-346	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C63	1500		250234-148	BPD-0015	DD-152	BYA10T15	ED-0015	DC5215	SHK-D15	
C64	140	4000	250235-2		DD60-121					
C65	1500		250234-46	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	SHK-D15	
C66	1500		250234-46	BPD-0015	DD-152	BYA10D15	ED-0015	DC5215	SHK-D15	
C67	1000		250218-2	BPD-01	DD-103	BYA681	ED-01	DC511	SHK-S1	
C68	10000		250219-2	BPD-01	DD-103	BYA681	ED-01	DC511	SHK-S1	
C69	300		250235-3		DD-301	L10T3	ED-300	UC-535	SGA-T3	

CONTROLS

ITEM No	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: MAGNAVOX PART No	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No	MALLORY PART No	INSTALLATION NOTES
R1A	500k		260128-55	B-50	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWS-12	78-1	U9-18	
R2	200k		260132-6				TA184L	Brightness
R3	1.25Meg		260132-7				TA155L	Vert. Hold
R4	2000Ω		260128-54	B-706	A47-2000-B	Q17-110	U7	Contrast
R5A	1.25Meg		260137-1					Vert. Size
B	500Ω							Vert. Lin.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MAGNAVOX PART No	IRC PART No.	NOTES
R6	100k		260104-86	BTS-100K	
R7	100k		260104-86	BTS-100K	
R8	8200Ω		260104-73	BTS-8200	
R9	33k		260104-80	BTS-33K	
R10	330k		260104-82	BTS-330K	
R11	33000Ω		260104-68	BTS-33000	
R12	10k		260104-74	BTS-10K	
R13	47k		260104-83	BTS-47K	
R14	6800Ω		260104-80	BTS-680	
R15	10k		260104-74	BTS-10K	
R16	10k		260104-74	BTS-10K	
R17	1800Ω		260104-53	BTS-180	
R18	33000Ω	1	260105-58	BTA-33000	
R19	10000Ω		260104-52	BTS-1000	
R20	33k 5%		260104-186		
R21	330Ω		260104-56	BTS-330	
R22	100Ω		260104-50	BTS-100	
R23	39Ω		260104-45	BTS-39	
R24	15k 5%		260104-187	BTS-15K 5%	
R25	330Ω		260104-56	BTS-330	
R26	120Ω		260104-51	BTS-120	
R27	4700Ω 5%		260104-175	BTS-4700 5%	
R28	470k		260104-94	BTS-470K	
R29	4700Ω	1	260105-70	BTA-4700	
R30	470k		260104-74	BTS-10K	
R31	680Ω		260104-80	BTS-680	Note 1
R32	330K		260104-90	BTS-330K	
R33	6800Ω		260104-72	BTS-6800	
R34	220Ω		260104-54	BTS-220	
R35	6800Ω		260104-72	BTS-6800	
R36	680Ω		260104-60	BTS-680	
R37	270K		260104-93	BTS-270K	
R38	470K		260104-94	BTS-470K	
R39	330Ω		260104-56	BTS-330	
R40	470K		260104-94	BTS-470K	
R41	1.5Meg		260104-100	BTS-1.5Meg	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: MAGNAVOX PART No	IRC PART No	NOTES
R42	33Meg 5%		260104-201	BTS-33Meg 5%	
R43	2.5Meg		260104-100	BTS-1.5Meg	
R44	3.7Meg 5%		260104-241	BTS-3.7Meg 5%	
R45	470K		260104-94	BTS-470K	
R46	33K		260104-78	BTS-33K	
R47	1000Ω 5%		260104-183	BTS-1000 5%	
R48	1500Ω 5%		260104-183	BTS-1500 5%	
R49	13000 5%		260104-181	BTS-1300 5%	
R50	1Meg 5%		260104-231	BTS-1Meg 5%	
R51	3.3Meg 5%			BTS-3.3Meg 5%	
R52	180Ω	1	260105-53	BTA-180	
R53	100K		260104-86	BTS-100K	
R54	4700Ω		260104-70	BTS-4700	
R55	470Ω		260104-55		
R56	2700		260104-55		
R57	100K		260104-86		
R58	100K		260104-86		
R59	10Ω	1	260105-36		
R60	470K		260104-94		
R61	6.7Meg		260104-106		
R62	75000 5%		260104-180		
R63	22000 5%		260104-167		
R64	100K 5%		260104-207	BTS-100K 5%	
R65	180K 5%		260104-213	BTS-180K 5%	
R66	22K 5%		260104-191	BTS-22K 5%	
R67	33Ω		260104-50		
R68	200K 5%		260104-214	BTS-200K 5%	
R69	18K 5%		260104-189	BTS-18K 5%	
R70	560Ω	1	260105-59	BTA-560	
R71	9.3Ω	1	231007-4	BW1-3.3	
R72	100Ω	2	231045-50	BTS-100	
R73	5Ω		260076-8	BTS-5	
R74	220K		260104-90	BTS-220K	

Note 1. Not used in some versions

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: MAGNAVOX PART No	Hallidarson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Osc. Trans.	320370-1					HO-266 *		
T2	Horiz. Output Trans.	320358-1					A-8149 ③	26S75①②③	A-11X ③
T3	Vert. Output Trans.	320369-1	Z100①②	A-2821 ③		V314 ④			
T4A	Yoke (90°) Horiz. (20MA)	260660-1	DF907①②	MDF-82	21SD1①③	V90Y18/43 ③④	DY-18A ③ ④	Y-18 ③ ④	Y-4 ③ YCI ⑤ CLJ ⑤
B	Vert. (45.5MA)	260658-1 ③							

① Use T to L turns ratio.
② Connect as auto transformer.
③ Drill new mounting hole(s).
④ Cut and tape blanking lead.
⑤ Yoke rear cover and centering device.
⑥ Use original yoke damping network.
⑦ Use original rear cover and centering device.
⑧ Yoke clamp.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

TERMINAL CONNECTIONS	ORIGINAL Hallidarson Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
1					1		
2					2		
3					3		
4					4		

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI	SEC	MAGNAVOX PART No.	REPLACEMENT DATA: Hallidarson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No	NOTES
T5	3400Ω	3-4Ω	320266-1	Z110X① ②	A-2968	A-3232	22S46 ①	S-36X ① ③	① Drill onew new mtg.hole. ② Tape taps on primary windings ③ Tape tap on primary winding

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: MAGNAVOX PART No.	QUAM PART No.	NOTES
SP1	4" x 6"	PM	3-4Ω	C580045-1	46A1	

COILS (RF-IF)

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L1	IF Trap Coil	360415-56	
L3	IF Trap Coil	360415-56	
L4	Det. Trans.	360402-1	
L4	RF Choke	360501-8	
L5	RF Choke	360415-56	

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L6	RF Choke	360501-8	
L7	RF Choke	360501-9	
L8	RF Choke	360501-6	
L9	Mixer Plate Coil	360540-1	

ITEM No	USE	REPLACEMENT DATA: MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L10	1st. Video IF	360681-1				
L11	2nd. Video IF	360682-1				
L12	Shunt Peaking Coil	360687-3	19-4400		6130	430 Microhenries
L13	Series Peaking Coil	360687-1	19-4301		6154	33 Microhenries
L14	Shunt Peaking Coil	360687-2	19-4360	TV-185	6151	330 Microhenries
L16	1st Sound IF	360644-1				
L16	2nd. Sound IF	360683-1				
L17	Quadrature Coil	360668-1				
L18	Line Choke	360670-1				1.7 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC. RES: PRI	SEC	MAGNAVOX PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L19	68Ω									

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~(L)	REPLACEMENT DATA: MAGNAVOX PART No.	Hallidarson PART No.	Merit PART No	Stancor PART No.	Thordarson PART No	Triad PART No
L20	.285 A	34Ω	.9 HY	320368-1	C5047 ①	C-2996 ①	C-2238 ①	28C44	C-32X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA
K1	Ant. Input	470MMF, 1Meg	250233-1	
K2	Ant. Input	470MMF, 1Meg	250233-1	
K3	Vert. Integrater	2000MMF, 5000MMF, 5000MMF, 22K, 82000, 82000	250232-1	Aerovox PA-110 Cenbraid PC-100 Cornell-Dubilier UB7MG Erie 1406-01 Sprague V-1

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: MAGNAVOX PART No	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No	SARKES TARZIAN PART No.	NOTES
M1	.285A	C530041-1 ①	1023A ①	1N1007 ①	MR350 ①	68350 ①	350A ①	

① Selenium type . ② Germanium type.

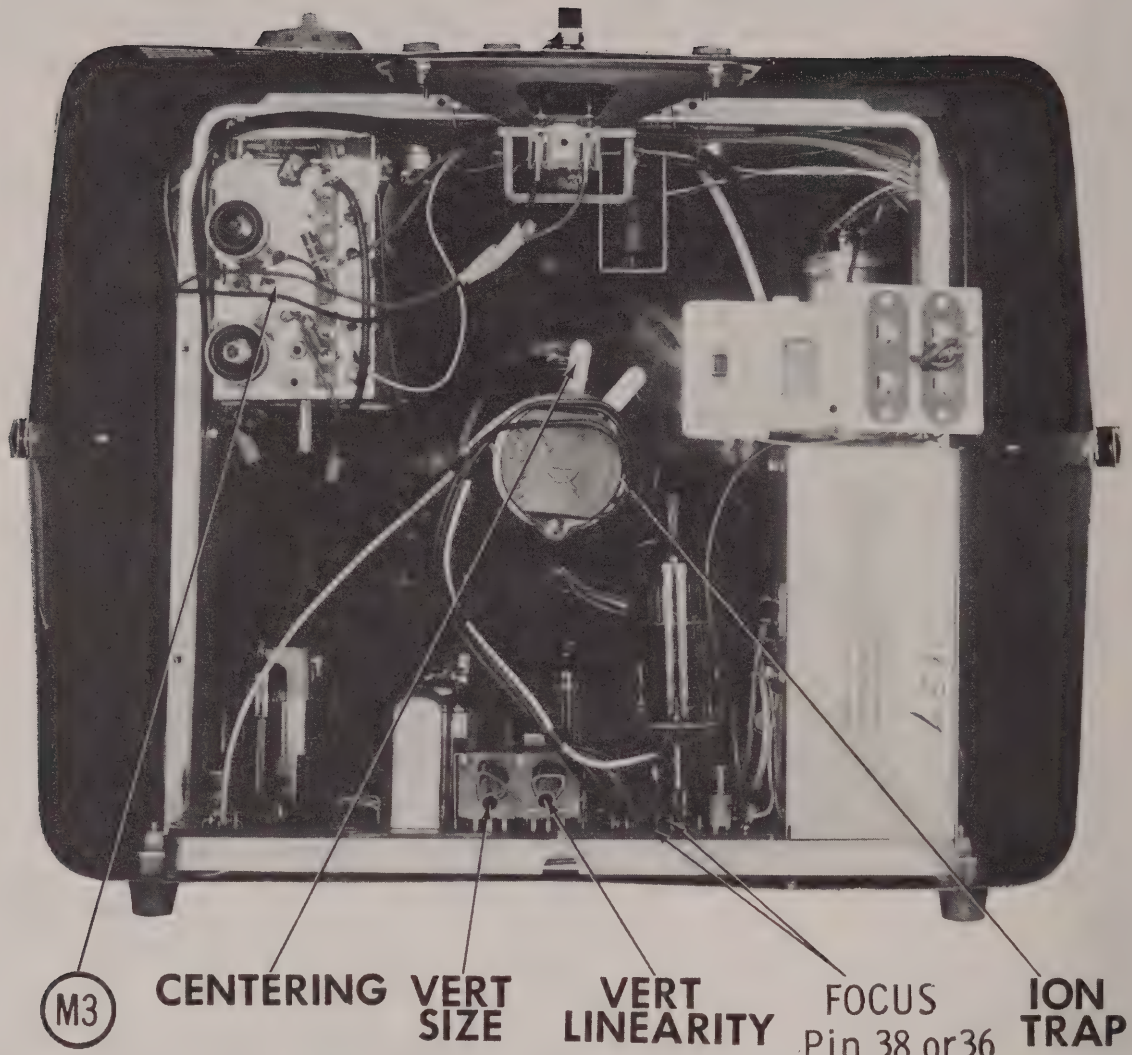
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: MAGNAVOX PART No.	SYLVANIA PART No.	NOTES
M3	1N94		1N90	Video Detector (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M3	Tuner	700555-1	VHF
M4	Tuner	700556	UHF
M4	Video Det. Assy.	380663-1	Includes 3rd. Video IF, Series Peaking Coil, Cap., resistor and M2
M5	Switch	160273-1	Strong-Normal-Distant, Slide Type (DPDT)
M6	Centering Device	380658-1	Not used in early versions.
M7	Ion Trap	380662-5	Includes Yoke fear cover
	Printed Board	210003-8	Video
	Printed Board	210004	Sound-Sync

MAGNAVOX Ch. V19-01AA, V19-02AA, U19-01AA, U19-02AA



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.

2. Set the brightness and contrast controls for a normal picture.

3. Loosen set screw and turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

4. Turn the horizontal hold slowly counter clockwise until the picture just falls into sync. Tighten set screw.

L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

MODEL 76T1

TRADE NAME	Motorola Models 76T1, 76T2 (Ch. HS-507)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
RATING	7MA @ 9 Volts DC
TUNING RANGE—BROADCAST	530KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1620KC	"	"	A4	"
3.		"	1400KC	Tune to 1400KC signal.	"	A5	Adjust for maximum output with chassis in cabinet.
	The following steps should be performed if the oscillator coil has been tampered with or replaced and does not track properly.						
4.		Loop	1620KC	Tuning gang fully open.	Across voice coil.	A4	Adjust for maximum output.
5.		"	532KC	Tuning gang fully closed.	"	A6	Adjust for maximum output. Repeat steps 4 & 5 until oscillator covers required range making step 4 the last adjustment.
6.		"	1400KC	Tune to 1400KC signal.	"	A5	Adjust for maximum output with chassis in cabinet.
7.		"	600KC	Tune to 600KC signal.	"	A7	Adjust for maximum output with chassis in cabinet. Repeat steps 6 & 7 until no further increase is obtained. Make step 7 the last adjustment.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1957 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	USE		MOTOROLA PART NO.	NOTES
X1	Converter	(2N140)	48C124255	
X2	1st IF Amp.	(2N139)	48C124256	
X3	2nd IF Amp.	(2N139)	48C124256	
X4	AF Amp.	(2N109)	48C124258	Note 1
X5	Driver	(2N109)	48C124258	Note 1
X6	Output	(2N109)	48K124276	Note 1, 2
X7	Output	(2N109)	48K124276	Note 1, 2

Note 1: X4, X5, X6 and X7 (Type 2N109) may be Motorola part no.
48C124258 (Green code)
48K124276 (Red code)
48K124259 (White code)
48K124275 (Yellow code)

Note 2: X6 and X7 must be a matched pair.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	25	6	23K636454 (Note 1)	XPP10V25	NL25-6	TAP6-30	ML30-6		TE-1091
C2	10	10	23K636453	XPP12V10	NL10-10	TAP25-10	ML10-15		TE-1114
C3	55	10	23K636455	XPP10V50	NL50-10	TT10X60			R2378*
C4	10	10	23K636453	XPP12V10	NL10-10	TAP25-10	ML10-15		TE-1114
C5	3	10	23B636452	XPP10V3	NL3-10	TAP75-3M	ML4-15		TE-1127
C6	10	10	23K636453	XPP12V10	NL10-10	TAP25-10	ML10-15		TE-1114
C7	55	10	23K636455	XPP10V50	NL50-10	TT10X60			R2378*
C8	55	10	23K636455	XPP10V50	NL50-10	TT10X60			R2378*

Note 1: Some versions may use 10MFD in this application. When replacing, use 25MFD.
* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C9	.01	400	8K125413	BPD-01	DF-103	BC6S1J	ED-01	ACE611	4SE-S1	
C10	10000		21K533472	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C11	.05	200	8B120842	BPD-05	DF-503	BC2S47J		ACE615	2SE-S5	
C12	.1	200	8K124831		DF-104	BC2P1J		ACE601	2SE-P1	
C13	.25	100	8K122249			BC2P22J		ACE6022	2SE-P25	
C14	75		21K124830							
C15	33		21K124829	NP0-SI 33	TCZ-33	C10Q33C	TCO-33	ZT-5433	5TCC-Q33	
C16	.05	200	8B120842	BPD-05	DF-503	BC2S47J		ACE615	2SE-S5	
C17	.05	200	8B120842	BPD-05	DF-503	BC2S47J		ACE615	2SE-S5	
C18	.1	200	8R121573		DF-104	BC2P1J		ACE601	2SE-P1	
C19	.1	200	8K124831		DF-104	BC2P1J		ACE601	2SE-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2000Ω	½	18B636450					Volume & Switch

RESISTORS

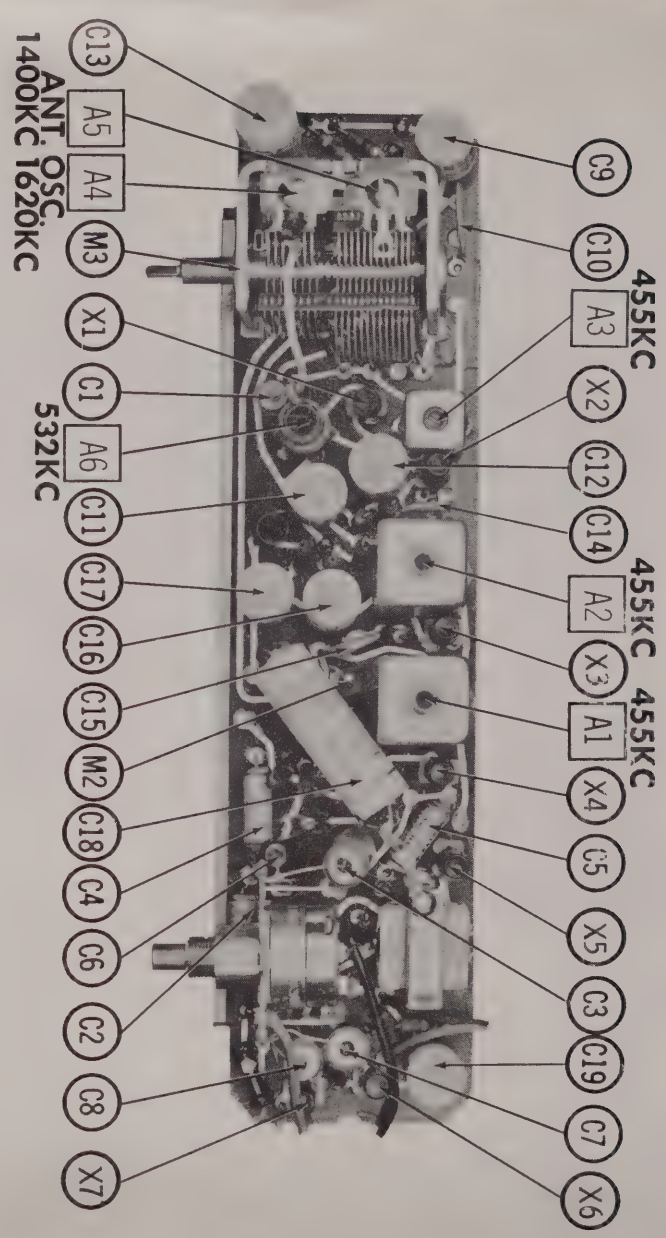
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	1200Ω		6R6393	BTS-1200	
R3	10K		6R6320	BTS-10K	
R4	560Ω		6R6291	BTS-560	
R5	82K		6R5644	BTS-82K	
R6	3900Ω		6R5659	BTS-3900	
R7	47K		6R6048	BTS-47K	
R8	100Ω		6R6326	BTS-100	
R9	820Ω		6R6269	BTS-820	
R10	47K		6R6048	BTS-47K	
R11	2200Ω		6R6069	BTS-2200	
R12	470Ω		6R6090	BTS-470	
R13	1500Ω		6R6038	BTS-1500	Note 2
R14	47K		6R6048	BTS-47K	
R15	2700Ω		6R5577	BTS-2700	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R16	68K		6R6074	BTS-68K	
R17	4700Ω		6R6080	BTS-4700	
R18	10K		6R6320	BTS-10K	
R19	1200Ω		6R6393	BTS-1200	
R20	1000Ω		6R6229	BTS-1000	
R21	56Ω		6R5614	BTS-56	
R22	2200Ω		6R6069	BTS-2200	
R23	10Ω		6R5621	BTS-10	
R24	12K		6R6394	BTS-12K	
R25	1500Ω		6R6038	BTS-1500	
R26	195Ω		6A636448		Note 1
R27	3.3Ω		6K124921		Note 2
R28	18Ω		6K122847	BTS-18	Note 2

Note 1: A special resistor 195Ω @ 25°C.
Note 2: Not used in some versions.

CHASSIS—T



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	Turns Ratio PRI.	Turns Ratio SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	1.4 : 1		25B636462				TA-3 ①		① Tape center tap on primary winding; use original mtg. frame and terminal board.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	540Ω CT	3-4Ω	25B636828				TR-27		

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	50C636827 ① ②	4A07 ③	① Motorola part # includes T2. ② Not used in some versions. ③ Cut slots for mounting tabs to match original.
	4"	PM	40Ω	50C636472 ① ②		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Loop Stick	1V636658*				Includes complete handle ass'y.
B	Ant. Coil					
L2	Osc. Coil	24B636666				
L3	1st IF Trans.	24K636460				
L4	RF Coil	24A636456				
L5	2nd IF Trans.	24K636459				
L6	3rd IF Trans.	24C636458				

* Part #1V636659 used in model 76T2.

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA BURGESS "A"	BURGESS "B"	BURGESS "A-B"	EVEREADY "A"	EVEREADY "B"	EVEREADY "A-B"	MALLORY "A"	MALLORY "B"	MALLORY "A-B"
M1	9V			D6*			276*			M-1603*	

* Connect two in parallel.

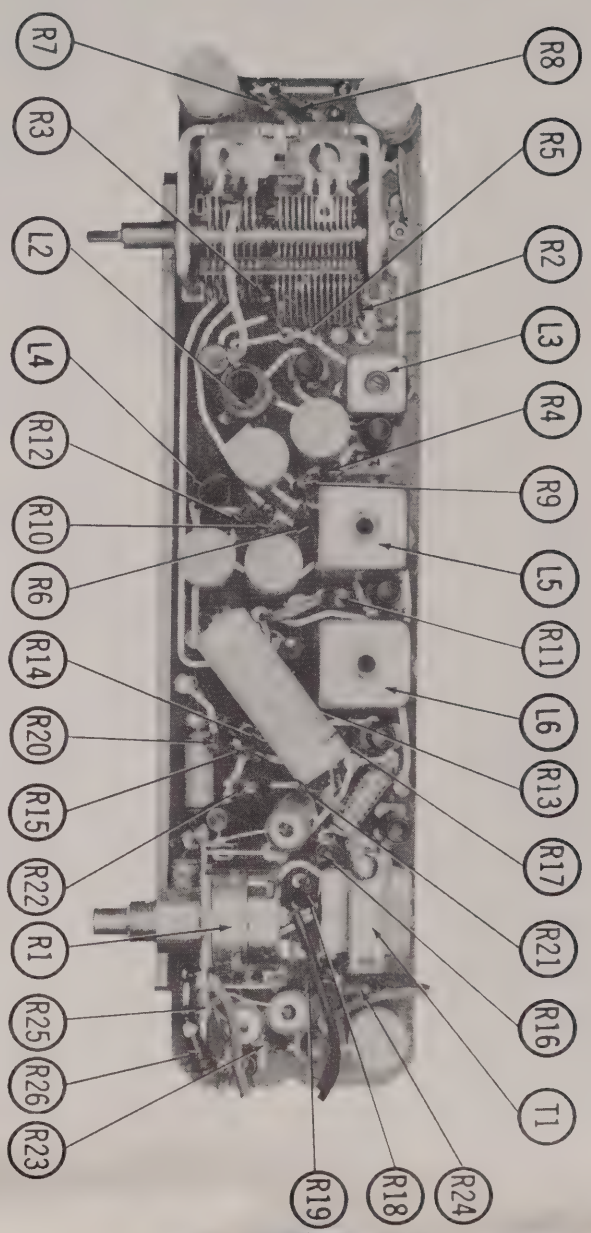
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA MOTOROLA PART No.	SYLVANIA PART No.	NOTES
M2		48K733204	1N60	Audio Detector (Pigtail)

MISCELLANEOUS

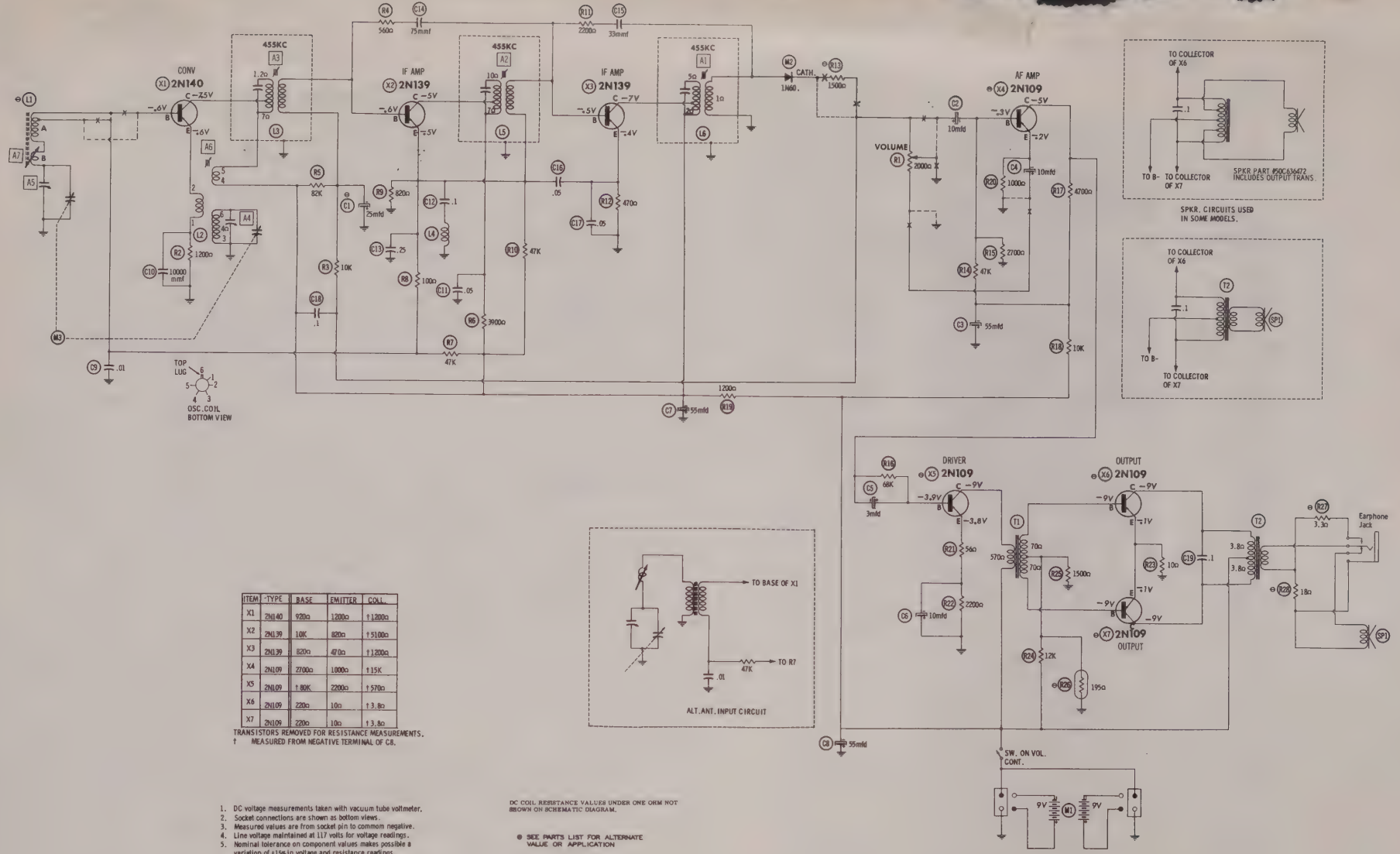
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Tuning Cap.	19K636451	Two Gang (30-365MMF, 20-110MMF)
	Printed Board	84B636810-B	
	Cabinet Grill	35C636266	
	Handle	1V636658	Black, Model 76T1, Includes L1.
	Handle	1V636659	Brown, Model 76T2, Includes L1.
	Knob	36C636224	Charcoal, Dial Scale.
	Knob	36C636225	Clear, Tuning
	Knob	36C636226	Charcoal, On-Off-Volume.
	Cabinet	1V636832	Charcoal, Model 76T1, Less Escutcheon and Grill.
	Cabinet	1V636833	Brown, Model 76T2, Less Escutcheon and Grill.

CHASSIS—TOP VIEW



MOTOROLA
MODEL 76T1 (Ch. HS-507)

MOTOROLA
MODEL 76T1 (Ch. HS-507)



ITEM	TYPE	BASE	EMITTER	COLL.
X1	2N140	920Ω	1200Ω	†1200Ω
X2	2N139	10K	820Ω	†5100Ω
X3	2N139	820Ω	470Ω	†1200Ω
X4	2N109	2700Ω	1000Ω	†15K
X5	2N109	†80K	2200Ω	†570Ω
X6	2N109	220Ω	10Ω	†3.8Ω
X7	2N109	220Ω	10Ω	†3.8Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM NEGATIVE TERMINAL OF CB.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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SONORA
MODELS 568, 585

SONORA
MODELS 568, 585

MODEL 568

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRADE NAME	Sonora Models 568, 585
MANUFACTURER	Sonora Radio & Tel. Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	AC-DC Operated AM Receiver
TUBES (Six)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det.-AVC-AF Amp., 12AV6 Phase Inverter, (2) 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC
RATING	.38 Amp. @ 117 Volts AC (37 Watts)
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

SONORA MODEL 568

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det.-AVC-AF Amp.	12AV6	
V4	Phase Inverter	12AV6	
V5	Output	35C5	
V6	Output	35C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SONORA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150		PRS150V80	BBRT42215	TCT3114	TDLT-6	FMT-315	R2406 *
B	20	150		4020	BR5015	TC49	TD-30-150	FM-1530	
C	50	150							

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SONORA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C3	250			SI 250	D6-251	LT6T25	GP-250	UC-5325	5GA-T25	
C4	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C5	.047	200		BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C6	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C7	.0033	600		BPD-0033	D6-332	CUB6D33	GP-3300	GEM-6233	6TM-D33	
C8	.047	200		BPD-05	DF-503	CUB2S47		GEM-6147	2TM-S47	
C9	.08	200								
C10	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C11	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C12	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C13	.01	400		BPD-01	DD-103	CUB4S1	GP-1000	GEM-411	4TM-S1	
C14	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C15	.047	200		BPD-05	DF-503	CUB4S47		GEM-4147	2TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SONORA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1M♦g	½	R-2209			♦	UF16A	Tone
B	500K						UR55-T154	Volume-tap @ 100K
C	Switch						US-26	

♦ Concentrikit Equivalent: K-6-Kit, Base Elements And Shafts B13-137, P17-102 (Panel) B13-133X , R1-118 (Rear) 76-1(Switch)

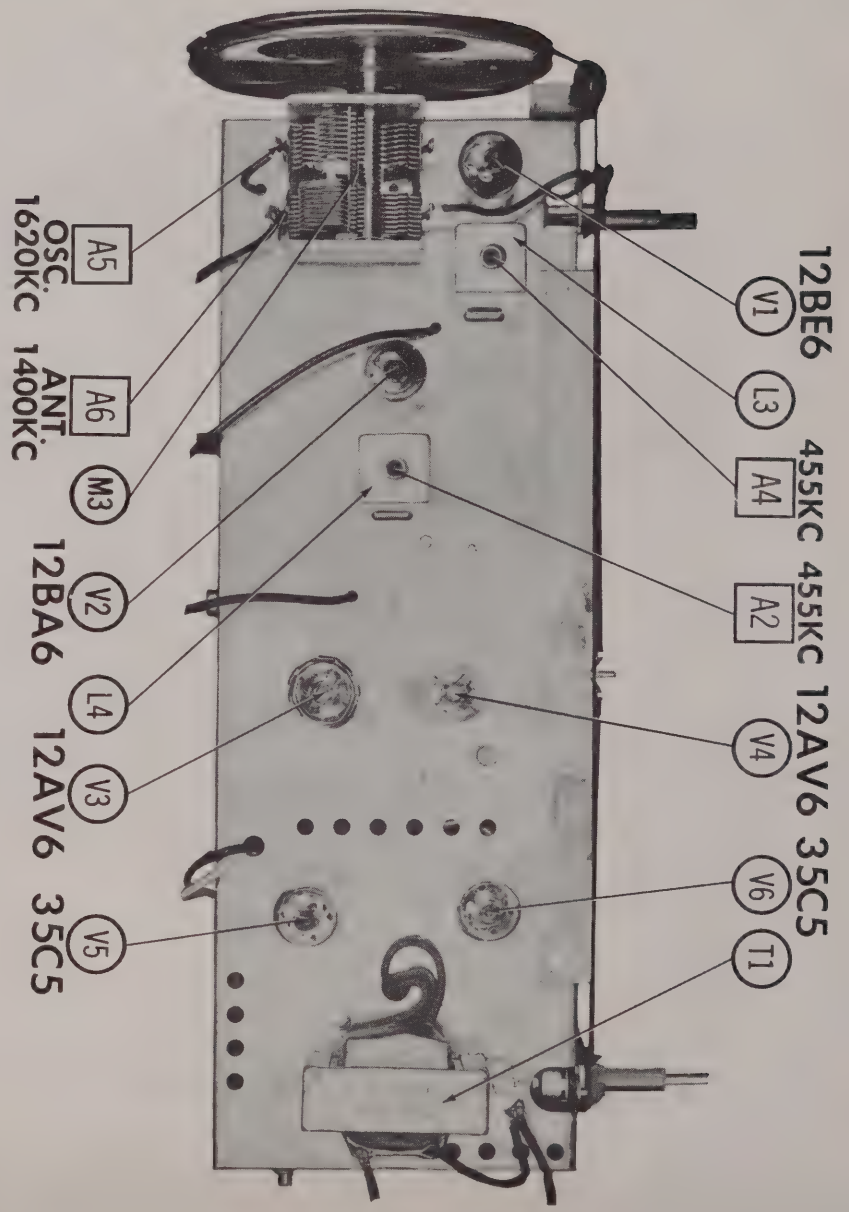
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R2	22K			BTS-22K	
R3	1Meg			BTS-1Meg	
R4	1Meg			BTS-1Meg	
R5	180Ω			BTS-180	
R6	22K			BTS-22K	
R7	6.8Meg			BTS-6.8Meg	
R8	270K			BTS-270K	
R9	6.8Meg			BTS-6.8Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SONORA PART No.	IRC PART No.	
R10	270K			BTS-270K	
R11	470K			BTS-470K	
R12	12K			BTS-12K	
R13	470K			BTS-470K	
R14	100Ω	1		BTA-100	
R15	820Ω			BTS-820	
R16	820Ω			BTS-820	
R17	22Ω	5			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SONORA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4000Ω CT	1.8Ω	R-2226	Z1007	A-2901	A-3823	24S61	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SONORA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	R-2222	4A07	
SP2	5"	PM	3-4Ω	R-2223	5A1	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		SONORA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Antenna					Includes cabinet back
L2	Osc. Coil	R-1777				
L3	Input IF	R-1237	16-6758	BC-352	12-C1	
L4	Output IF	R-1237	16-6758	BC-353	12-C2	

COMPONENT COMBINATIONS

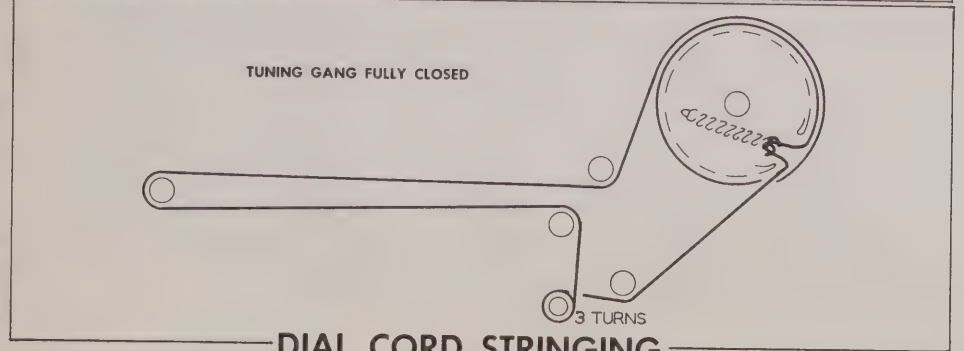
ITEM No.	USE	DESCRIPTION	SONORA PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	50MMF, 50MMF, 47K		Aerovox	PA-99
				Centralab	PC-52
				Cornell-Dubilier	111TM3
				Erie	1403-03
				Sprague	D-3

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	SONORA PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.100A	R-2224	1004A	RS100	6S150	5M1	100	

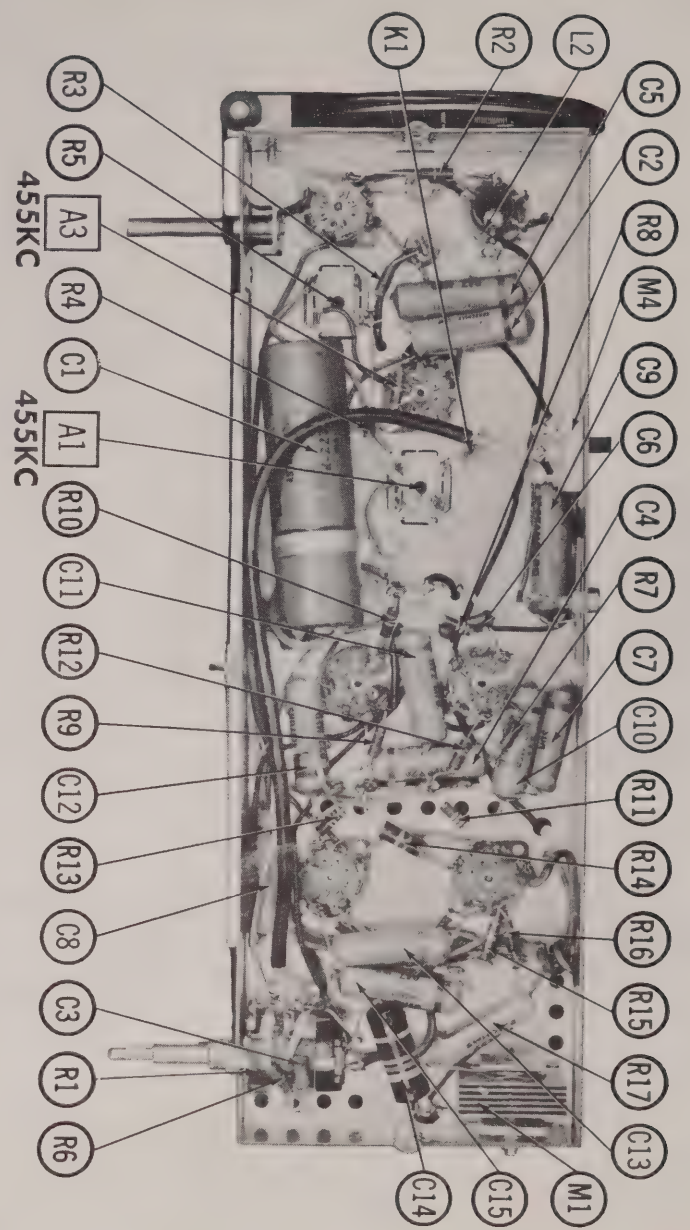
MISCELLANEOUS

ITEM No.	PART NAME	SONORA PART No.	NOTES
M2	Pilot Light		115V, 7 Watt
M3	Tuning Cap.	R-2229	Two Gang (14-260MMF, 17-120MMF)
M4	Switch		Radio-Phono, Slide Type (DPDT)



DIAL CORD STRINGING

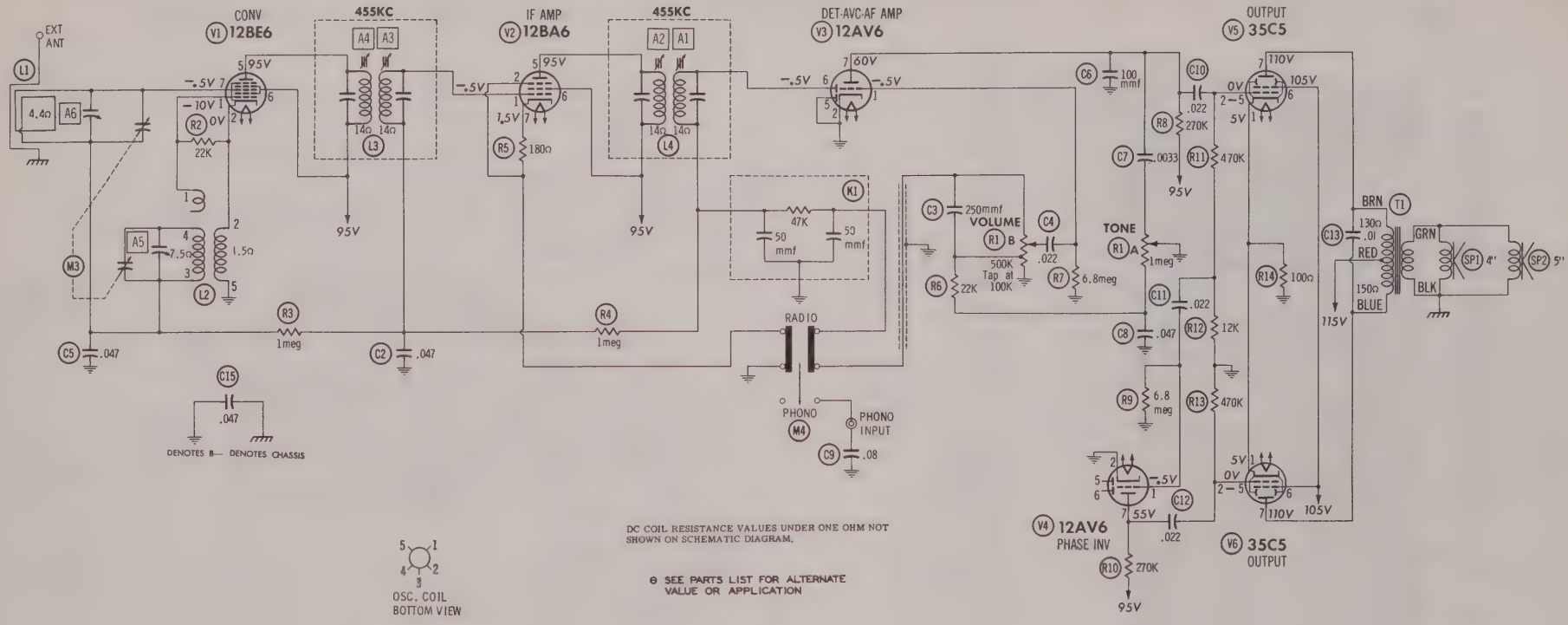
CHASSIS—BOTTOM VIEW



SET 360 FOLDER 8

SONORA MODEL 568

SONORA MODEL 568



5 1 4 2 3
OSC. COIL BOTTOM VIEW

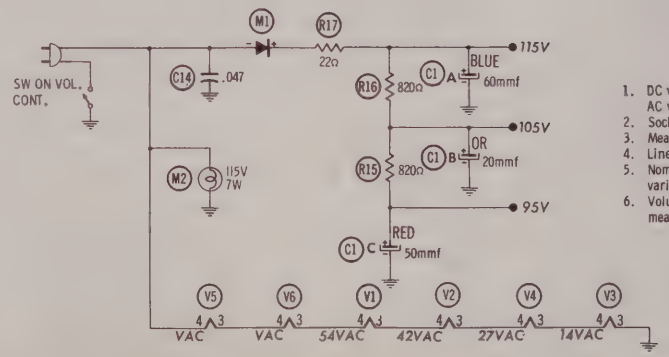
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.5Ω	40Ω	52Ω	†1650Ω	†1650Ω	2.5Meg
V2	12BA6	1.5Meg	0Ω	25Ω	40Ω	†1650Ω	†1650Ω	180Ω
V3	12AV6	6.8Meg	0Ω	0Ω	15Ω	0Ω	550K	†270K
V4	12AV6	6.8Meg	0Ω	15Ω	25Ω	NC	NC	†270K
V5	35C5	100Ω	480K	85Ω	120Ω	480K	†850Ω	†150Ω
V6	35C5	100Ω	470K	52Ω	85Ω	470K	†850Ω	†170Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION
RADIO-PHONO SW IN "RADIO" POSITION



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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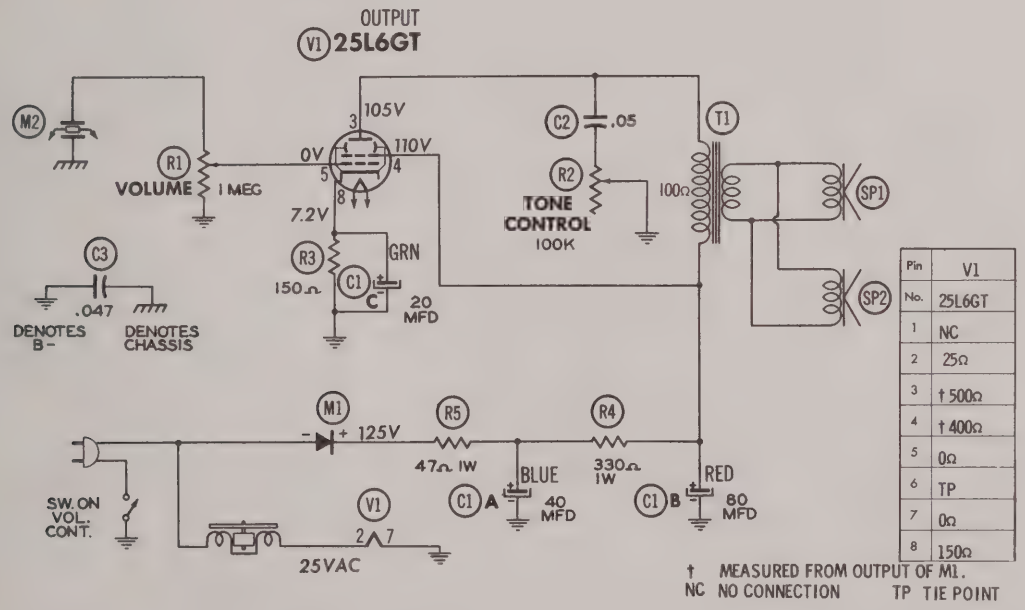
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

STEELMAN
MODEL 3D15U

TRADE NAME	Steelman Model 3D15U
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (One)	Type 25L6GT Output
POWER SUPPLY	105-125 Volts AC-60 Cycles RATING .34 Amp. @ 117 Volts AC



Pin No.	V1 25L6GT
1	NC
2	25Ω
3	† 500Ω
4	† 400Ω
5	0Ω
6	TP
7	0Ω
8	150Ω

† MEASURED FROM OUTPUT OF M1.
NC NO CONNECTION TP TIE POINT

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360-9

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Output	25L6GT	

ITEM No.	USE	TYPE	NOTES

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150		PRS150V8040	BBRT84215	TCT3117	TDLT-7	FMT-333	TVA-3455
B	80	150		20					
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	200		BPD-05	DF-503	CUB2S5		GEM-415	2TM-S5	
C3	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	VC-42	AB-70	A47-1Meg-Z	Q13-137	U-53	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2A	100K	½	VC-102	AB-41	A47-100K-Z	Q13-128	U-39	Tone
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R3	150Ω			BTS-150	
R4	330Ω	1		BTA-330	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R5	47Ω	1		BTA-47	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	STEELMAN PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2250Ω	1.6Ω	TR-126	Z1001	A-2930	A-3877	24S51	S-3X	

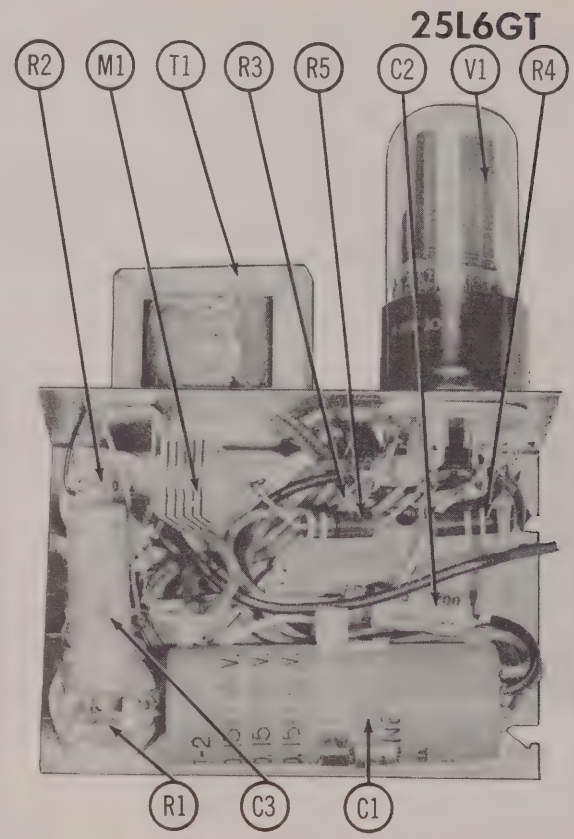
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	SP-42	4A07	
SP2	4"	PM	3-4Ω	SP-42	4A07	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	STEELMAN PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.045A		1263A	R8050	6S65	8J1	50	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2		*P-66-T		*2646		*Complete tone arm and cartridge ass'y.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	JENSEN PART No.	WALCO PART No.	
M3	(Std)	†CR-55 or ♦CR-55D	†W-64S or ♦W-64D	† Jewel ♦ Diamond
	(LP)	†CR-55LP or ♦CR-55LPD	†W-64MGS or ♦W-64MGD	

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DENVER, COLORADO

SYLVANIA MODELS 14P101 Series,
14P201 Series (Ch. 1-525-1, -2)

SYLVANIA MODEL 14P201T (CH. 1-525-1)

TRADE NAME	Sylvania	MODELS	CHASSIS
		14P101, 14P201J, 14P201R, 14P201T	1-525-1
		14P201JU, 14P201RU, 14P201TU	1-525-2
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tele. Div., 700 Ellicott St., Batavia, N. Y.		
TYPE SET	Television Receiver		
TUBES	Fourteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING 115 Watts, 1 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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Tube Placement Chart (Top View) 3

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PHOTOFACT* Folder

*TRADE MARK

SYLVANIA MODELS 14P101 Series, 14P201 Series (Ch. 1-525-1, -2)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type control knobs from the side of the cabinet.
2. Remove 6 metal screws and the rear cover.
3. Remove 4 chassis bolts from the bottom of the cabinet.
4. Remove 1 screw (at back of handle) securing the top of the chassis.
5. Remove picture tube socket, Ion trap, yoke clamp and 2 speaker leads.
6. Partially remove the chassis, remove HV lead, remove the chassis.
7. Remove 2 speaker nuts and the speaker.

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CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS

Care should be exercised when connecting test equipment or physically contacting chassis.

MODELS	CHASSIS
14P101, 14P201J, 14P201R, 14P201T	1-525-1
14P201JU, 14P201RU, 14P201TU	1-525-2

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws below the front of the cabinet, remove front screw in handle, remove the front and safety glass.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2. Readjust the Ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. For location, see tube placement chart.

FUSES

A 7.5Ω fusible resistor (R71) is used for LV power supply protection. (For location see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

SYLVANIA MODELS 14P101 Series, 14P201 Series (Ch. 1-525-1, -2)

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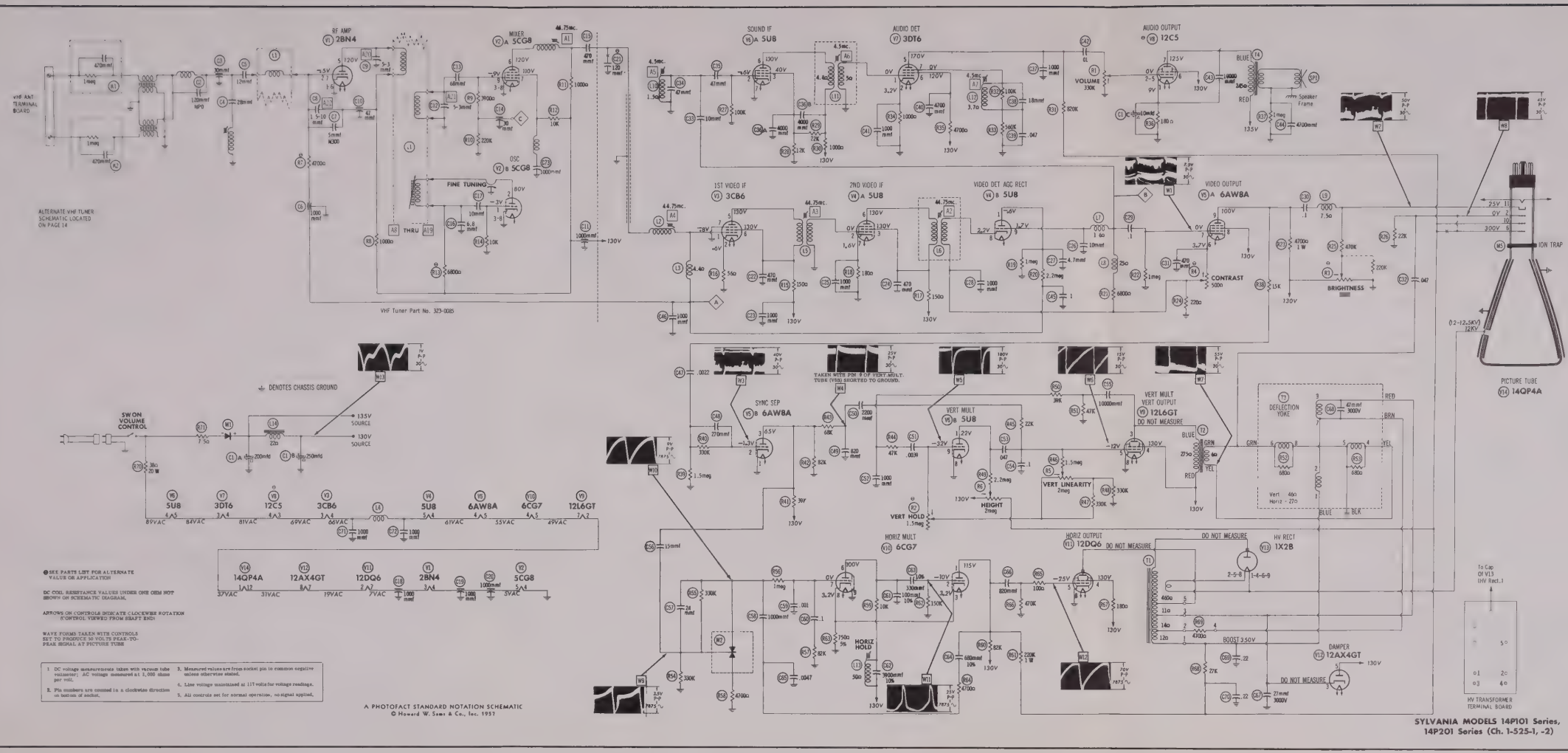
RF AMP V1 2BN4
MIXER V2A 5CG8
OSC V2B 5CG8
SOUND IF V6A 5U8
AUDIO DET V7 3DT6
AUDIO OUTPUT V8 12C5
1ST VIDEO IF V3 3CB6
2ND VIDEO IF V4A 5U8
VIDEO DET AGC RECT V4B 5U8
VIDEO OUTPUT V5A 6AW8A
SYNC SEP V5B 6AW8A
VERT MULT V5B 5U8
VERT MULT VERT OUTPUT V9 12L6GT
HORIZ MULT V10 6CG7
HORIZ OUTPUT V11 12DQ6
HV RECT V13 1X2B
DAMPER V12 12AX4GT
PICTURE TUBE V14 14QP4A
ION TRAP
DEFLECTION YOKE
VOLUME
CONTRAST
BRIGHTNESS
VERT LINEARITY
HEIGHT
VERT HOLD
HORIZ HOLD
FINE TUNING
SW ON VOLUME CONTROL
DENOTES CHASSIS GROUND
135V SOURCE
130V SOURCE
VHF ANT TERMINAL BOARD
ALTERNATE VHF TUNER SCHEMATIC LOCATED ON PAGE 14
VHF Tuner Part No. 323-0085
TAKEN WITH PIN 8 OF VERT. MULT. TUBE (V8B) SHORTED TO GROUND.
DO NOT MEASURE
BOOST 350V
HV TRANSFORMER TERMINAL BOARD
To Cap. Of V13 (HV Rect.)
V1 4 5 6 5U8 89VAC
V2 3 4 7 3DT6 84VAC
V3 3 4 6 12C5 81VAC
V4 3 4 6 3CB6 69VAC
V5 4 5 8 5U8 66VAC
V6 4 5 8 6AW8A 61VAC
V7 4 5 8 6CG7 55VAC
V8 7 2 5 12L6GT 49VAC
V9 14QP4A 1 A12 37VAC
V10 12AX4GT 1 A7 31VAC
V11 12DQ6 2 7 7VAC
V12 2BN4 3 4 6.3VAC
V13 5CG8 4 5 6.3VAC
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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SYLVANIA MODELS 14P101 Series, 14P201 Series (Ch. 1-525-1, -2)

SYLVANIA MODELS 14P101 Series, 14P201 Series (Ch. 1-525-1, -2)

TUBE PLACEMENT CHART

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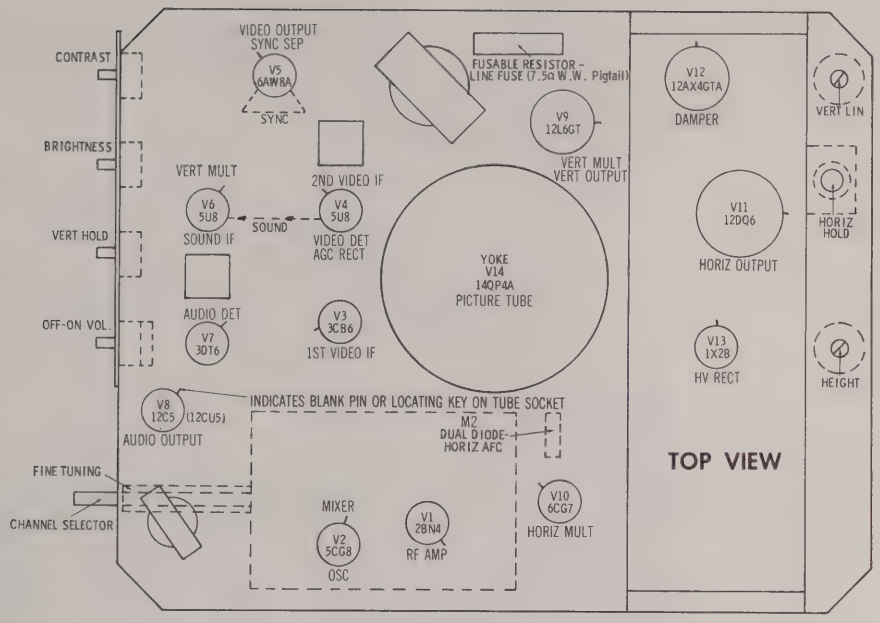


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

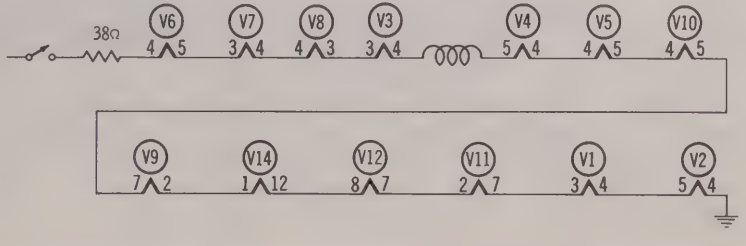
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R71), Rectifier (M1)**

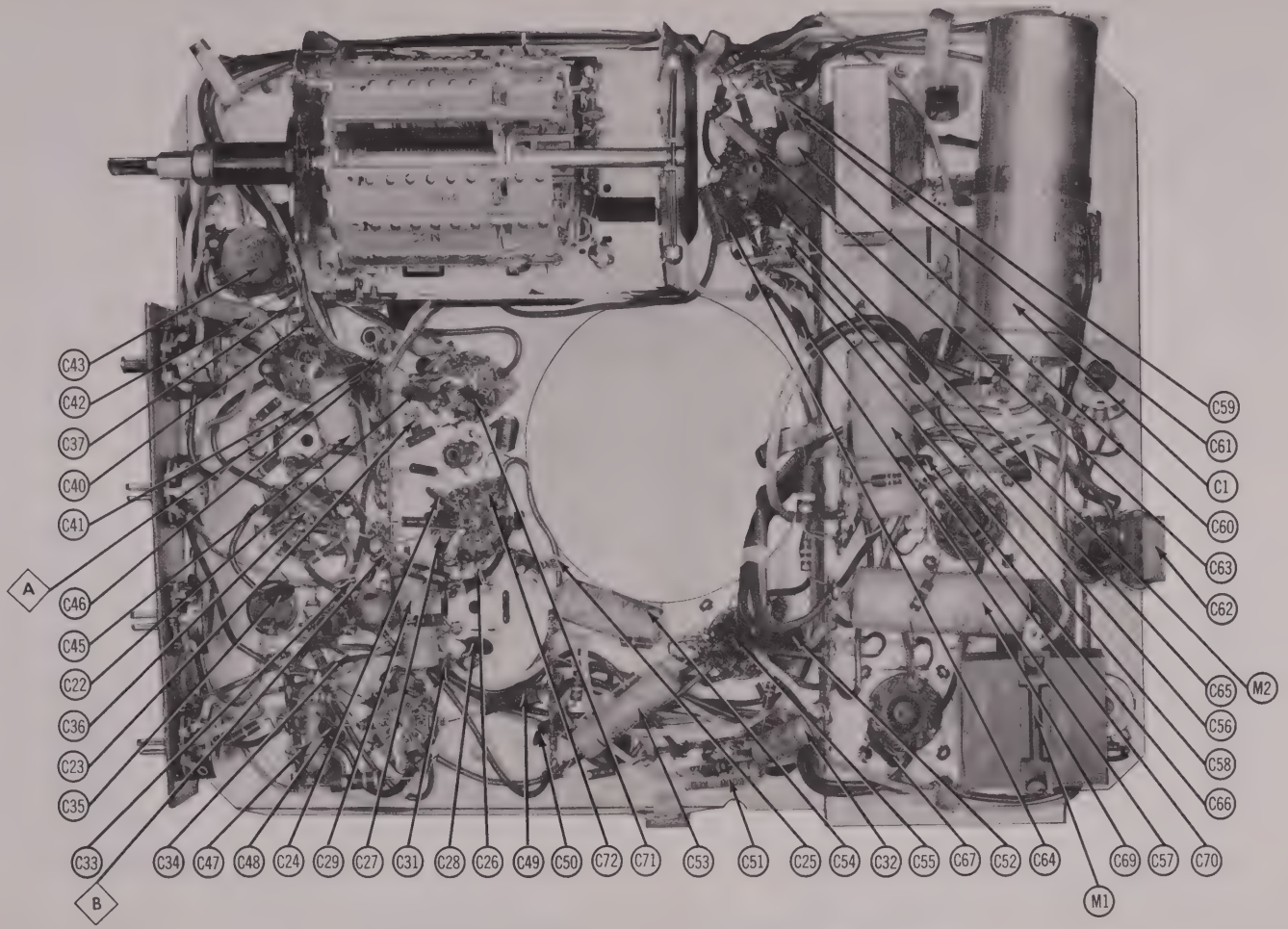
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4**
No pic, no sound, has snow - **V1, V2**
No pic, has sound, has raster - **V5, V14**
Has pic, no sound - **V6, V7, V8**

SYNC FAILURE
No vert. sync - **V5**
No horiz. sync - **V5, Diode (M2)**
No vert. or horiz. sync - **V5**

SWEEP FAILURE
No raster, has sound - **M2, V10, V11, V12, V13, V14**
No vertical deflection - **V6, V9**
Poor vert. linearity or foldover - **V6, V9**
Poor horiz. linearity or foldover - **V10, V11, V12**
Narrow picture - **V10, V11, V12, M1**
Vert. off freq. - **V6, V9**
Horiz. off freq. - **V10**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below.)





CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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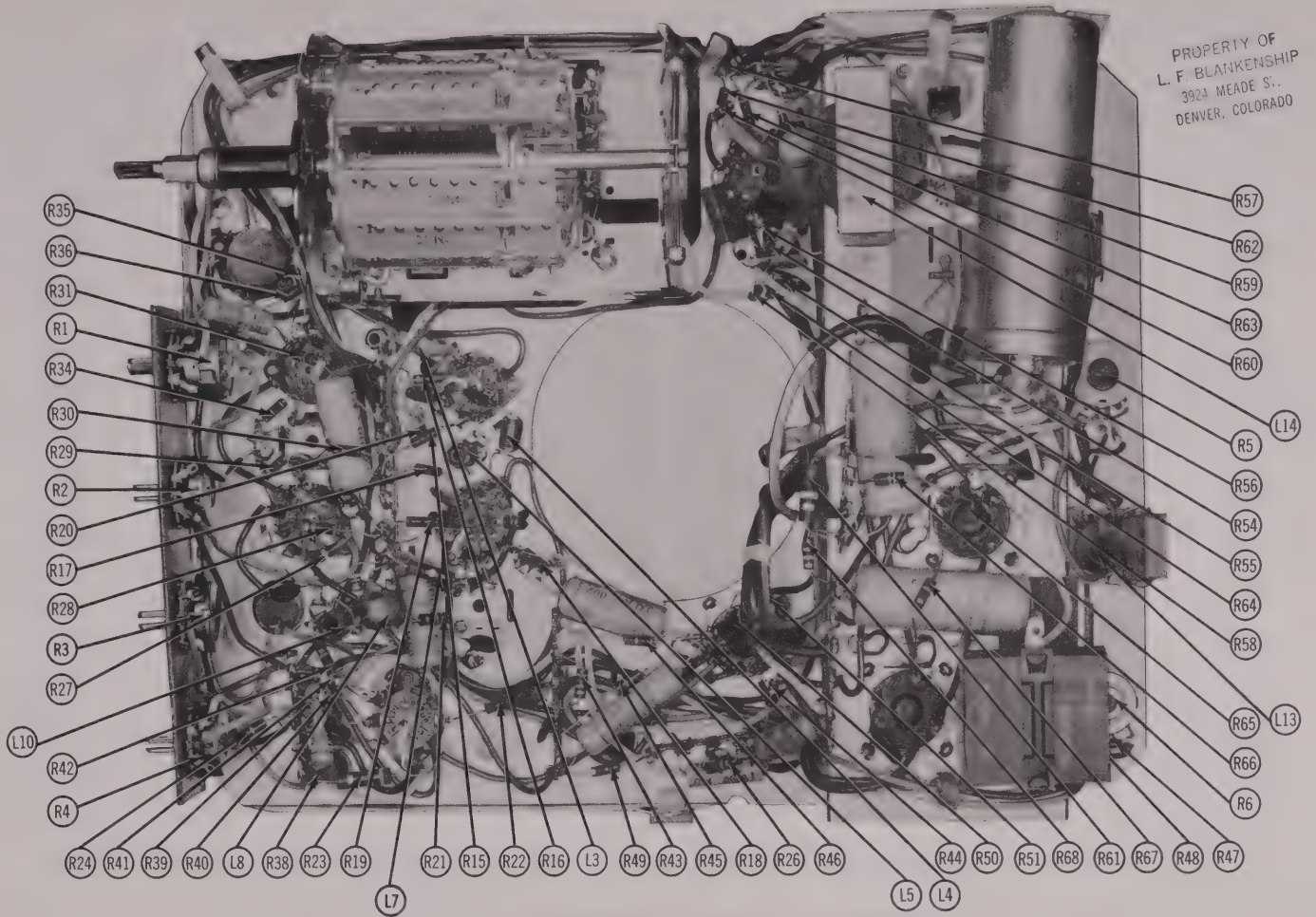


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS--READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT .
Allow a 20 minute warm-up period for the receiver and test equipment.
The High Voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ . Positive to chassis.
Set channel selector between any two channels.
Turn contrast control fully counter clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.005MFD	High side to point Ⓒ . Low side to chassis.	Not used	44.75MC	Between any two channels	USE VTVM. DC probe to point Ⓑ . thru network (Fig. 1). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection. Reduce input to maintain 1 to 2 volt indication on the VTVM.
2.	"	"	44.0MC (10MC Swp)	43.55MC 44.75MC 45.75MC	"	Vert.Amp.thru network (Fig. 1) to point Ⓑ . Low side to chassis.	A1, A4	Use only enough sweep generator output to provide usable pattern on scope. Adjust A1 to place 43.55MC marker at 50% on low frequency side of curve as in Fig. 2. Adjust A4 to place 45.75MC at 50% on high frequency side of curve.

SOUND IF ALIGNMENT

Turn contrast control fully clockwise.
Preset A7 as far outward in coil form as possible.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
3.	.005MFD	High side to point Ⓑ . Low side to chassis.	4.5MC (Unmod)	Between any two channels	DC probe to pin 2 (cathode) of V7 thru 10K. Common to chassis.	A5, A6	Adjust for maximum deflection. Maintain input to provide a reading of 3.5 to 5 volts on VTVM.
4.	"	"	"	"	DC probe to pin 5 (plate) of V7. Common to chassis.	A7	Adjust A7 for a reading of 125 volts (with input signal of maximum and line voltage at 117 volts).
5.		Remove signal.		"	"	A6	Retouch A6 for MINIMUM deflection.

If a signal generator of crystal accuracy is not available, tune in a strong TV signal for above adjustment.

VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".
Keep all exposed ends of test equipment leads as short as possible including ground leads.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the center of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point Ⓑ . Low side to chassis.	A8	Adjust to place sound marker in trap notch as in Fig. 3. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A9	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A10	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A11	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A12	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A13	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A14	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A15	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A16	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A17	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A18	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A19	

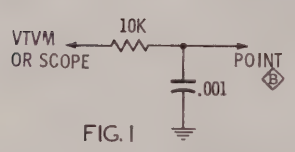


FIG. 1

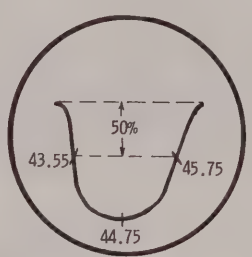


FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT FOR TUNER #323-0085

Connect bias as under "Video IF Alignment".
Keep all exposed ends of test equipment leads as short as possible including ground leads.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A20, A21	Adjust for response curve similar to Fig. 4 with markers above 90%.
8.	"	"	"	"	"	"	A22	Adjust for MINIMUM amplitude of response curve.
9.	"	"	213MC (10 MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 4. If markers fall below 70% on any channel, make compromise adjustments of A20 and A21 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

VHF RF AND MIXER ALIGNMENT FOR TUNER #323-0084

Connect bias as under "Video IF Alignment".
Keep all exposed ends of test equipment leads as short as possible including ground leads.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point Ⓒ. Low side to chassis.	A20, A21, A23	Adjust for response similar to Fig. 4 with markers above 90%.
8.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 4. If markers fall below 70% on any channel, make compromise adjustments of A20, A21 and A23 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

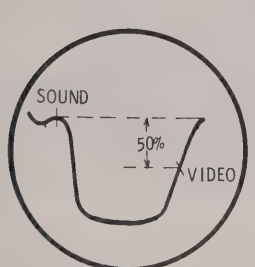


FIG. 3

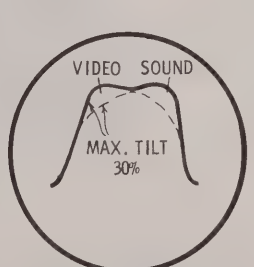
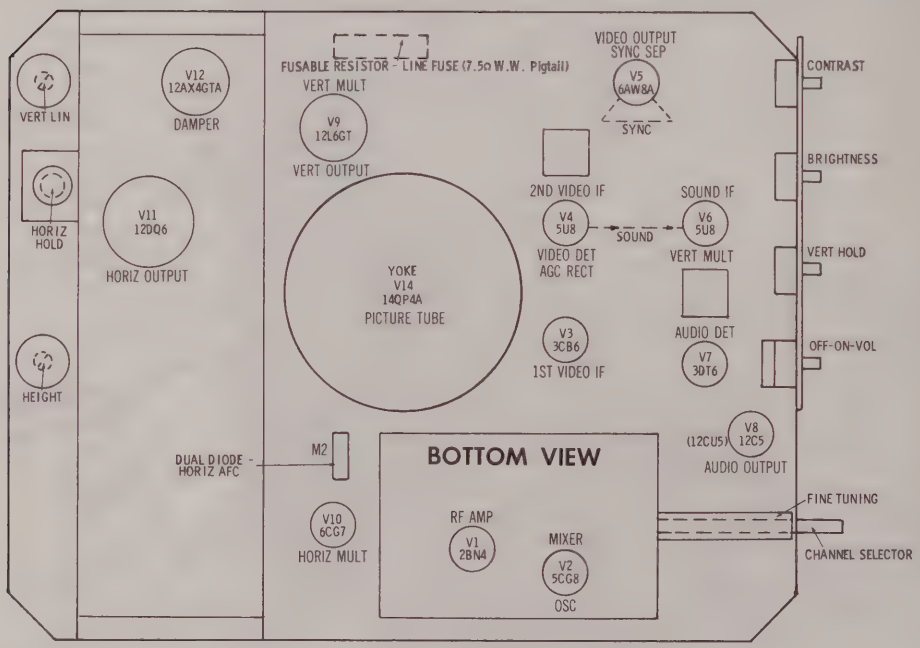


FIG. 4

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	2BN4	0Ω	3.2Meg	1.5Ω	1Ω	†1000Ω	0Ω	3.2Meg		
V2	5CG8	10K	†6800Ω	0Ω	0Ω	1Ω	†1000Ω	†10K	0Ω	224K
V3	3CB6	3.2Meg	56Ω	17Ω	15Ω	†170Ω	†170Ω	0Ω		
V4	5U8	1Meg	.1Ω	†170Ω	14Ω	15Ω	†170Ω	180Ω	220Ω	7000Ω
V5	6AW8A	0Ω	1.8Meg	†23K	14Ω	12.5Ω	•330Ω	1Meg	†22Ω	†4700Ω
V6	5U8	‡2.3Meg	100K	†15K	27Ω	25Ω	†1000Ω	0Ω	0Ω	•1.3Meg
V7	3DT6	5Ω	1000Ω	25Ω	23Ω	‡820K	†4700Ω	560K		
V8	12C5	180Ω	20Ω	17Ω	23Ω	20Ω	†22Ω	†245Ω		
V9	12L6GT	TP	8.5Ω	†300Ω	†22Ω	•1.9Meg	TP	11Ω	0Ω	
V10	6CG7	†82K	150K	750Ω	12.5Ω	11Ω	†10K	1.4Meg	750Ω	0Ω
V11	12DQ6	NC	4.5Ω	NC	†200Ω	470K	TP	1.5Ω	0Ω	TOP CAP ‡11Ω
V12	12AX4GT	NC	NC	¶	NC	†22Ω	NC	4.5Ω	7Ω	
V13	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡470Ω
V14	14AP4A	8.5Ω	22K	Pin 6 ‡27K	Pin 10 ‡27K	Pin 11 •490K	Pin 12 7Ω			

† MEASURED FROM OUTPUT OF M1. NC NO CONNECTION
‡ MEASURED FROM PIN 3 OF V12. TP TIE POINT
• THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
¶ THIS READING CAN VARY GREATLY, (200K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.



TUBE PLACEMENT CHART

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CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amplifier	3BN4	
V2	Mixer-Oscillator	3C96	
V3	1st Video IF Amp	6CB6	
V4	2nd Video IF Amp - Video Det-AGC Rect.	5U8	
V5	Video Output-Sync Sep	6AW8A	
V6	Sound IF Amp - Vert Multi	5U8	
V7	Audio Detector	3DT6	
V8	Audio Output	1A7G	Note 1
V9	Vert. Multi.-Vert. Output	12L6GT	
V10	Horiz. Multi.	8CG7	
V11	Horiz. Output	12BQ6	
V12	Damper	12AX6GT	
V13	HV Rectifier	1X2B	

Note 1. Some models may use 12CU5 in this application.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	SYLVANIA PART No	CBS PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	
V14	14QP4A		14QP4A ①	14QP4A ②	① Aluminized
		14QP4	14QP4	14QP4	② Silver screen "85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA					
	CAP	VOLT	SYLVANIA PART No	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No	PYRAMID PART No	SANGAMO PART No
C1A	▲200	150	4S-3328	PR3-012		WT330	CDB-T-1015	D-995
B	▲250	150						FMT-1530
C	▲10	150						

* Non -catalog item

ITEM No	SPRAGUE PART No
C1A	R2375 *
B	
C	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE MALLORY PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	130			NPO-S1 130	TCS-130	CDT13C	TCO-130		5TCC-T13	NPO
C3	30									
C4	18									
C5	13									
C6	1000			EF-001	MFT-1000				503C-D1	
C7	8									N300
C8	5.5-10				S29-10					
C9	5.5-9				S29-3		3115-D	CT565A		
C10	47									
C11	1000			EF-001	MFT-1000				503C-D1	
C12	3-8				S29-3		3115-D	CT565A		
C13	68									
C14	30									
C15	470			BPD-00047	DD-471	BYA0T471	ED-470	UC-5347	5GA-T47	
C16	5.5									
C17	10									
C18	1000			EF-001	MFT-1000				503C-D1	
C19	1000			EF-001	MFT-1000				503C-D1	
C20	130			BPD-00013	DD-131	LJ0T13	ED-130	UC-5313	5GA-T13	Note 1
C21	470		166-0470N	BPD-00047	DD-471	BYA0T471	ED-470	UC-5347	5GA-T47	
C22	1000		166-1000D	BPD-001	DD-102	BYA8DI	ED-1000	DC52	5HK-D2	
C24	470		166-0470N	BPD-00047	DD-471	BYA0T471	ED-470	UC-5347	5GA-T47	
C25	1000		166-1000D	BPD-001	DD-102	BYA8DI	ED-1000	DC52	5HK-D2	
C26	10		166-0010P	SI 10	DC-100	LJ0Q	ED-10	UC-546	5GA-Q	
C27	4.7		168-0008N	NPO-S1 4.7	TCZ-4R7	C30Y47C	TCO-4.7	ET-5447	5TCCB-V47	
C28	1000		166-1000D	BPD-001	DD-102	BYA8DI	ED-1000	DC52	5HK-D2	
C29	.01	300	160-0601	P468H-1	DF-104	CUB4PI		CEM-301	4TM-P1	
C30	.1	400	160-0601	P468H-1	DF-104	CUB4PI		GEM-401	4TM-P1	
C31	470		166-0470N	BPD-00047	DD-471	BYA0T471	ED-470	UC-5347	5GA-T47	
C32	.047	300	160-0647	BPD-05	DF-503	CUB3B47		GEM-3147	3TM-S47	
C33	10		166-0010P	SI 10	DE-100	LJ0Q	ED-10	UC-546	5GA-Q	
C34	47		166-0047P	BPD-0000047	DD-470	LJ0Q47	ED-47	UC-5447	5GA-Q47	
C35	47		166-0047P	BPD-0000047	DD-470	LJ0Q47	ED-47	UC-5447	5GA-Q47	
C36A	6000		180-0058A	BPD-62X04	DE-6021	BTC6D6Q	ED-6004	UC-5340	5HE-D06	
B	6000				DE-6021		ED-004	UC-5240		
C37	1000		166-1000	BPD-001	DD-103	BYA8DI	ED-1000	DC52	5HK-D2	
C38	18		166-0018N	BPD-000015	DD-180	LJ0T18	ED-18	UC-5418	5HK-Q18	
C39	.047	300	160-0647	BPD-05	DF-503	CUB3B47		GEM-3147	3TM-S47	
C40	4700		166-4700D	BPD-0047	DD-472	BYA0D047	ED-0047	UC-5247	5HK-D47	
C41	1000		166-1000D	BPD-001	DD-102	BYA8DI	ED-1000	DC52	5HK-D2	
C42	.01	400	160-0601	P468H-1	DF-104	CUB4PI		GEM-401	4TM-P1	
C43	1000		166-0022	BPD-01	DD-103	BYA8DI	ED-01	DC51	5HK-B1	
C44	4700		166-4700D	BPD-0047	DD-472	BYA0D047	ED-0047	UC-5247	5HK-D47	
C45	.1	400	160-0601	P468H-1	DF-104	CUB4PI		GEM-401	4TM-P1	
C46	1000		166-1000D	BPD-001	DD-102	BYA8DI	ED-1000	DC52	5HK-D2	
C47	.0033	600	160-0633	BPD-0033	DF-333	CUB3D3A	ED-0033	GEM-5233	5TM-D33	
C48	270		166-0270N	BPD-00027	DD-271	LJ0T27	ED-270	UC-5327	5GA-T27	
C49	820		166-0820P	BPD-00082	DD-821	LJ0T82	ED-820	UC-5382	5GA-T82	
C50	2200		166-2200	BPD-0022	DD-222	BYA0D22	ED-0022	UC-5222	5GA-Q22	
C51	.0039	400	160-0649	BPD-0039	DF-393	CUB4D39	ED-0039	GEM-4239	4TM-D39	
C52	1000		166-1000	BPD-001	DD-102	BYA8DI	ED-1000	DC52	5HK-D2	
C53	.047	600	160-0647	BPD-05	DF-503	CUB4B47		GEM-4147	4TM-S47	
C54	.1	400	160-0601	P468H-1	DF-104	CUB4PI		GEM-401	4TM-P1	
C55	10000		166-0022	BPD-01	DD-103	BYA8DI		DC51	5HK-B1	
C56	15		166-0015P	SI 15	DE-150	LJ0Q15	ED-15	UC-5415	5GA-Q15	
C57	24		166-0024	BPD-000025	DD-250	LJ0Q24	ED-24	UC-5425	5GA-Q25	
C58	1000		166-1000D	BPD-001	DD-102	BYA8DI	ED-1000	DC52	5HK-D2	
C59	.01	500	160-0621	BPD-001	DF-103	CUB4D1		GEM-421	4TM-D1	
C60	.1	200	160-0601	P288H-1	DF-104	CUB3P1		GEM-301	3TM-P1	
C61	100		183-0100	1489-0001		22R5T1			M8-31	
C62	3300		183-0100	1484-0039		1S5D39			M8-329	10%
C63	330		183-0330	1489-00033		5S5T33			M8-333	10%
C64	680		183-0680	1484-00068		1S5T68			M8-368	10%
C65	.0047	300	160-0634T	BPD-0047	DD-472	CUB3D47	ED-0047	GEM-3247	3TM-D47	
C66	820		166-0820P	BPD-00082	DD-821	LJ0T82	ED-820	UC-5382	5GA-T82	
C67	27	3000	189-0050		DD30-270					
C68	47	3000	189-0051	#YD-30-47	DD30-470	HYA30Q47		DC30447	30GAB-Q47	
C69	.22	600	160-0602	P688H-22		CUB6P22		GEM-6222	6TM-P22	
C70	.22	600	160-0602	P688H-22		CUB6P22		GEM-6222	6TM-P22	
C71	1000		166-1000D	BPD-001	DD-103	BYA8DI	ED-1000	DC51	5HK-D1	
C72	1000		166-1000D	BPD-001	DD-103	BYA8DI	ED-1000	DC51	5HK-D1	
C73	1000									

Note 1. Not used in some versions.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	1	157-0049	B-50 ①	A47-500K-2①	Q43-132 ①	U48 ①	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			EB-1	SWS-12	T5-1	U3-28	
R2A	1. 5Meg	½	153-0108	B-T43 ①	A47-1.5Meg-d ①	Q11-158 ①	TA15SL	Vert. Hold
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	150K	½	153-0109	B-43 ①	A47-150K-s ①	Q41-336 ①	TA104L	Brightness - ③
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R4A	500Ω	½	157-0110	B-4 ①	A47-500-S ①	Q41-103 ①	TA5SL	Contrast
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R5A	1Meg	½	153-0111	AB-75	A47-1Meg-d	Q11-138	PTA15L	Vert. Lin.
B	Shaft			AK-19	RN-3	TQ	Not Req.	
R6A	1Meg	½	153-0111	AB-75	A47-1Meg-d	Q11-139	PTA15L	Height
B	Shaft			AK-19	RN-3	TQ	Not Req.	

① When using bushing type replacement control use an extra mounting nut behind mounting panel.
② 2Meg control may be used in some versions. When using the 150K replacement control for the 2Meg control, remove the 330K resistor from center of control to ground.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R7	4700Ω		181-0472	BTS-4700	Note 1
R8	1000Ω		181-0102	BTS-1000	
R9	3900Ω			BTS-3900	
R10	220K		181-0234	BTS-330K	
R11	1000Ω		181-0102	BTS-1000	
R12	10K		181-0103	BTS-10K	
R13	6800Ω		181-0682	BTS-6800	Note 2
R14	10K		181-0103	BTS-10K	
R15	150Ω		181-0151	BTS-150	
R16	56Ω		181-0058	BTS-56	
R17	150Ω		181-0151	BTS-150	
R18	180Ω		181-0181	BTS-180	
R19	1Meg		181-0105	BTS-1Meg	
R20	2. 2Meg		181-0225		
R21	6800Ω		181-0682	BTS-6800	
R22	1Meg		181-0105	BTS-1Meg	
R23	4700Ω	½			
R24	220Ω		181-0221	BTS-220	
R25	470K		181-0474	BTS-470K	
R26	22K		181-0223	BTS-22K	
R27	100K		181-0104	BTS-100K	
R28	22K		181-0223	BTS-22K	
R29	22K		181-0223	BTS-22K	
R30	1000Ω		181-0102	BTS-1000	
R31	820K		181-0824	BTS-820K	
R32	100K		181-0104	BTS-100K	
R33	560K		181-0564	BTS-560K	
R34	1000Ω		181-0102	BTS-1000	
R35	4700Ω		181-0472	BTS-4700	
R36	180Ω		181-0181	BTS-180	
R37	1Meg		181-0105	BTS-1Meg	
R38	15K		181-0153	BTS-15K	
R39	1. 5Meg		181-0155	BTS-1. 5Meg	

ITEM No	RATING.		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R40	330K		181-0334	BTS-330K	
R41	39K		181-0393	BTS-39K	
R43	82K		181-0823	BTS-82K	
R43	68K		181-0683	BTS-68K	
R44	47K		181-0473	BTS-47K	
R45	22K		181-0223	BTS-22K	
R46	1. 5Meg		181-0155	BTS-1. 5Meg	
R47	330K			BTS-330K	
R48	330K		181-0334	BTS-330K	
R49	2. 2Meg		181-0225	BTS-2. 2Meg	
R50	39K		181-0393	BTS-39K	
R51	47K		181-0473	BTS-47K	
R52	6800Ω		181-0681		
R53	8800Ω		181-0881		
R54	330K		181-0334		
R55	330K		181-0334		
R56	1Meg		181-0105		
R57	82K		181-0823		
R58	4700Ω		181-0473		
R59	10K		181-0103		
R60	82K		181-0823		
R61	330K	1			
R62	150K		181-0154		
R63	77500 ±%		181-07515		
R64	4700Ω		181-0472		
R65	100Ω		181-0101	BTS-100	
R66	470K		181-0474	BTS-470	
R67	180Ω		181-0181	BTS-180	
R68	27K		181-0273	BTS-27K	
R69	470Ω		181-0472	BTS-4700	
R70	39Ω	20	189-0074		
R71	7. 5Ω		187-0028	FR7. 5	

Note 1: A 10K resistor may be used in some versions.
Note 2: A 3900Ω resistor may be used in some versions.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		SYLVANIA PART No	Halldorson PART No	Merit PART No	RCA TYPE No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Horiz. Output Trans.	24L-0044					HO-381 ①	F1X-109 ②	
T2	Vert. Output Trans.	24L-0043	S2900 ①	A-3333 ②			S8870 ①	S-108X ②	A-106X ②
T3A	Yoke(70°)Horiz(21M3P)	108-0030	DF805 ③	MDF-75 ③	222D ③	T70F20/43 ③	DY-22A ③	Y-30 ③ ⑤	Y-32-1 &
B	Vert (44M2G)								WW9 ③
		400-0034 ③							YC1 ③
		467-0070 ④							CL1 ③

① Use S to 1 horiz ratio.
② Drill new mounting hole(s).
③ Yoke rear cover and centering device.
④ Yoke clamp.
⑤ Connect horiz. damping capacitor across yoke terminals #3 and #7.
⑥ Use original yoke damping network, if necessary.
⑦ Use original rear cover and centering device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5				5	5	6	
3				3	3		
2				2	2	5	
1				1	1	2	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T4	2800Ω	3-4Ω	143-0055	Z1103 ① ②	A-3025	A-3332	22S43 ①	S-13X	① Drill one new mtg. hole. ② Taps on primary winding.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	539-0418	4A07	

COILS (RF-IF)

ITEM No.	USE	SYLVANIA PART No.	NOTES
L1A	Ant., RF, Mixer Grid, Osc. Coils	130-0003	Channel 3
B	Ant., RF, Mixer Grid, Osc. Coils	130-0003	Channel 3
C	Ant., RF, Mixer Grid, Osc. Coils	130-0004	Channel 4
D	Ant., RF, Mixer Grid, Osc. Coils	130-0005	Channel 5
E	Ant., RF, Mixer Grid, Osc. Coils	130-0006	Channel 6
F	Ant., RF, Mixer Grid, Osc. Coils	130-0007	Channel 7

ITEM No.	USE	SYLVANIA PART No.	NOTES
L1G	Ant., RF, Mixer Grid, Osc. Coils	130-0008	Channel 8
H	Ant., RF, Mixer Grid, Osc. Coils	130-0009	Channel 9
I	Ant., RF, Mixer Grid, Osc. Coils	130-0010	Channel 10
J	Ant., RF, Mixer Grid, Osc. Coils	130-0011	Channel 11
K	Ant., RF, Mixer Grid, Osc. Coils	130-0012	Channel 12
L	Ant., RF, Mixer Grid, Osc. Coils	130-0013	Channel 13

ITEM No	USE	REPLACEMENT DATA			NOTES
		SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.
L3	1st Video IF	130-0018		TV-131	6325
L4	RF Choke	146-0026	19-6033		
L4	PIL Choke	147-0033			
L5	2nd Video IF	118-0030	17-4524	TV-130	6319
L6	3rd Video IF	118-0019	17-5004	TV-125	6334
L7	Series Peaking Coil	146-0038	19-1018		4613
L8	Shunt Peaking Coil	131-9031			6156
L9	Series Peaking Coil	131-9033	19-1250	TV-185	6161
L10	Choke	130-0004	17-3400	TV-151	1499
L11	2nd Sound IF	130-0018	17-3496	TV-113	8303
L13	Quadrature Coil	134-0003	20-1008	TV-121	1490

ITEM No	REPLACEMENT DATA	NOTES
	MILLER PART No.	
L3	6325	37 Microhenries
L4		1. 5 Microhenries
L5	6319	
L6	6334	
L7	4613	10 Microhenries
L8	6156	820 Microhenries
L9	6161	250 Microhenries
L10	1499	
L11	8303	
L13	1490	

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.
L13	50Ω		132-0018	19-1578	TV-183	6210			83-S

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D C RESISTANCE	INDUCTANCE @ CURRENT 1000 ^(c)/_(s)	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L14	.130 A	220	.6HY	146-0034	C9041 ①	C-3981 ①	C-3339 ①	36C41	C-37X

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	Ant. Input	470MMF, 1Meg		
K2	Ant. Input	470MMF, 1Meg		

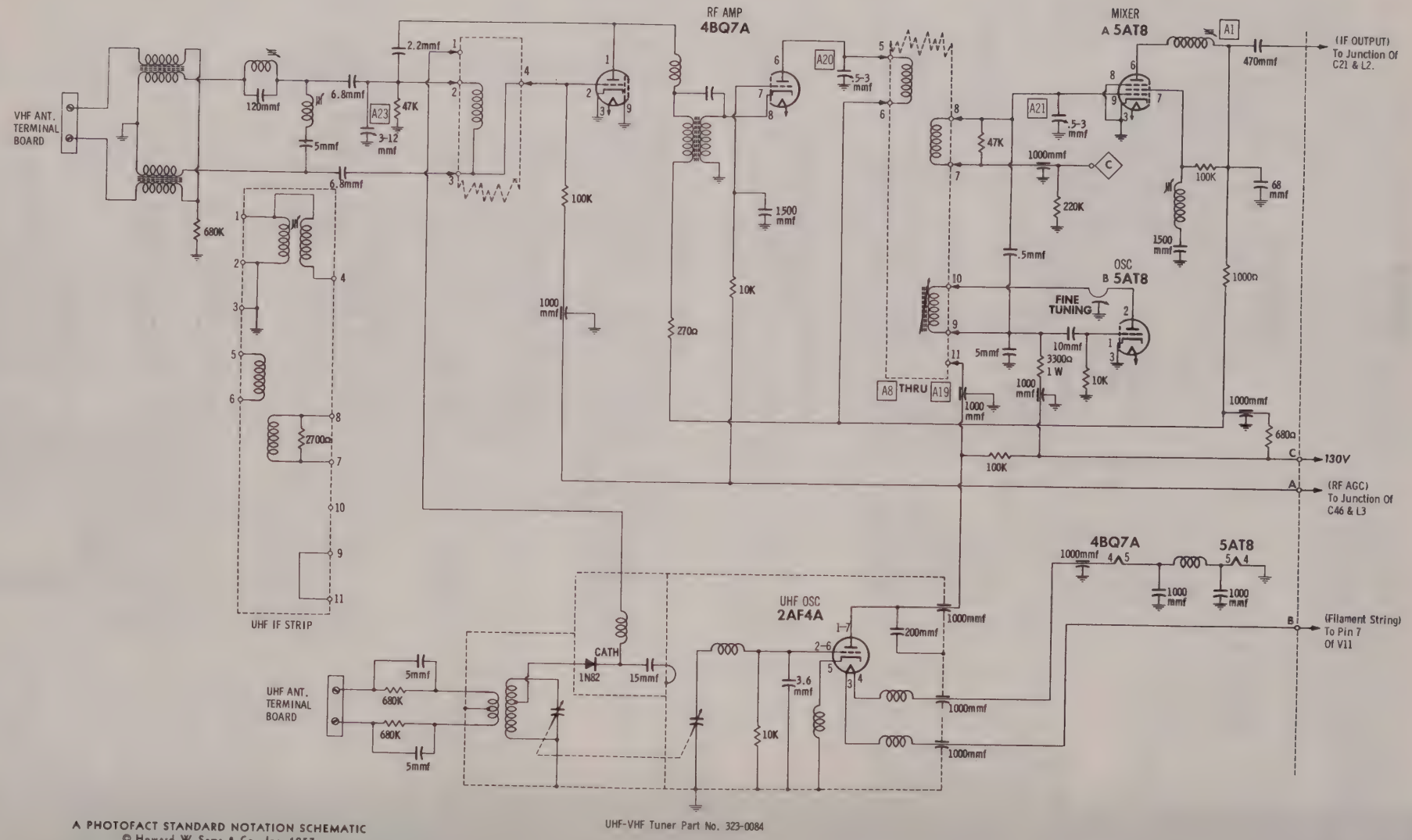
RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA							
	CURRENT (Measured)	SYLVANIA PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	MALLORY PART No	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.
M1	.35Ma	517-0015 ①	1035A ①	UN007 ③	RS2308L ①	6G350 ①	6QA5 ①	390A ①
M3		594-0005 ①	1218 ① ③		RS2308L ①			

① Selenium type.
② Germanium type.
③ 2 required.

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Tuner	323-0086	VHF, Used in 1-525-1 Chassis.
	Tuner	323-0086	UHF/VHF, Used in 1-525-2 Chassis.
M4	Centering Device	400-0031	Includes Yoke Cover
M5	Ion Trap	400-0032	
	Yoke Clamp	467-0070	
	Safety Glass	715-0016	Clear
	Safety Glass	715-0015	Tinted
	Mask	714-0097	Models 14P302, 7U.
	Mask	714-0098	Models 14P302R, SU, T, 7U.
	Mask	714-0098	Model 14P10.
	Knob	7 43-0049	VHF Channel Selector (VHF Models)
	Knob	743-0050	VHF Channel Selector (UHF/VHF Models)
	Knob	743-0051	UHF Channel Selector
	Knob	740-0098	Fine Tuning (VHF Models Only)
	Knob	740-0140	Fine Tuning (UHF/VHF Models)
	Knob	740-0139	Control, 4 Used



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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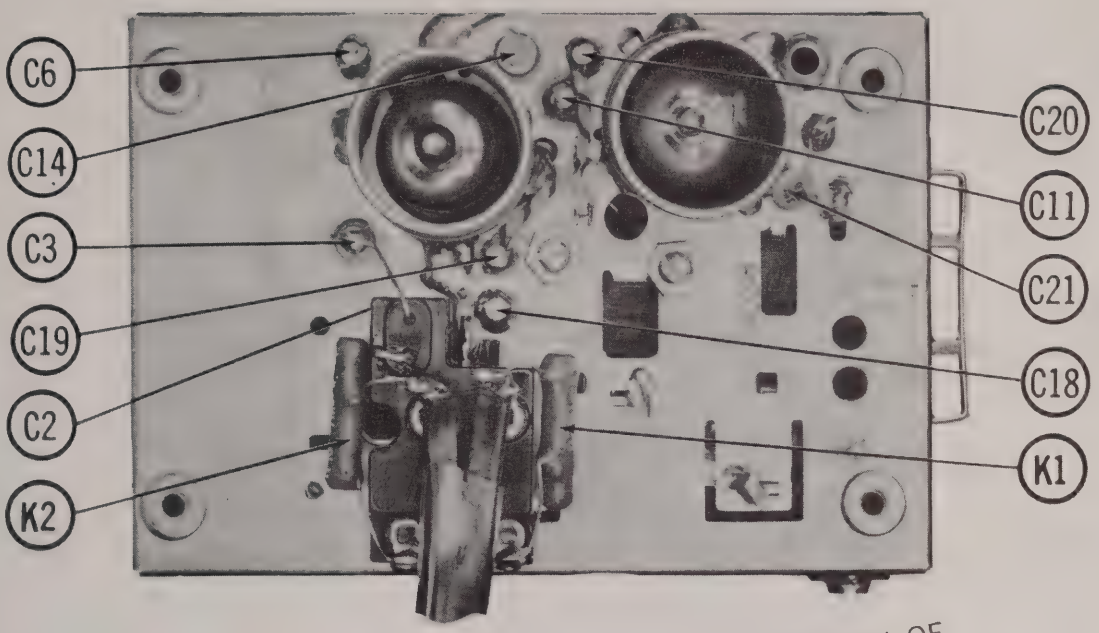
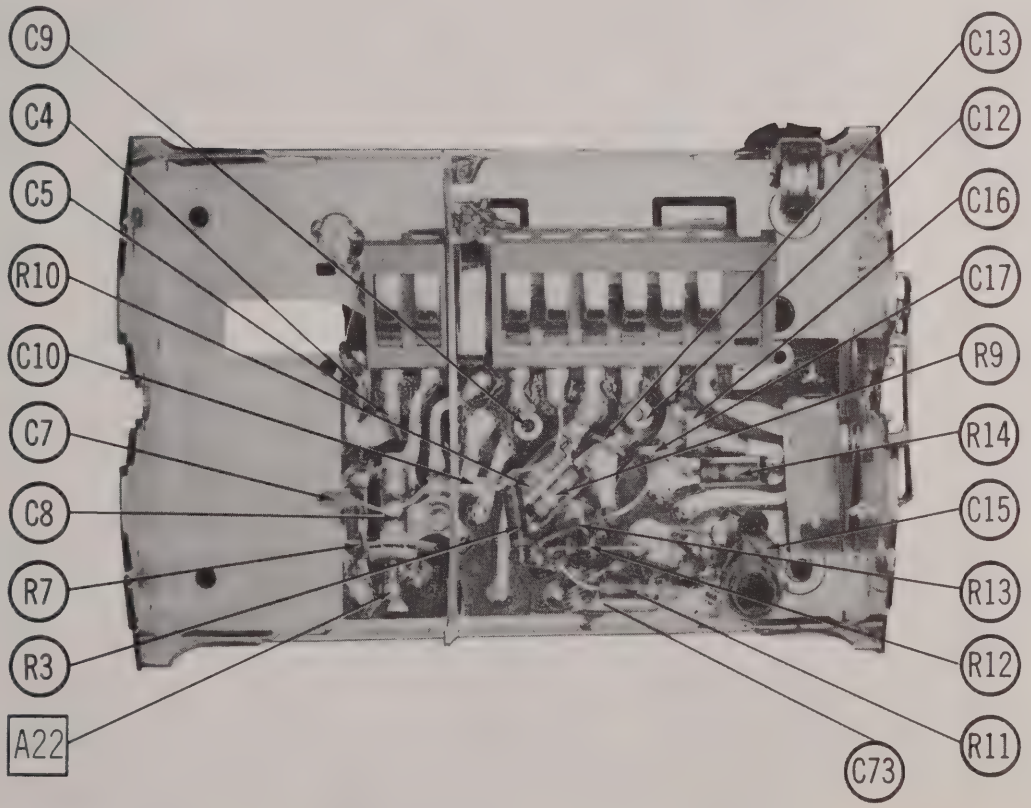
UHF-VHF Tuner Part No. 323-0084

ALTERNATE UHF/VHF TUNER SCHEMATIC

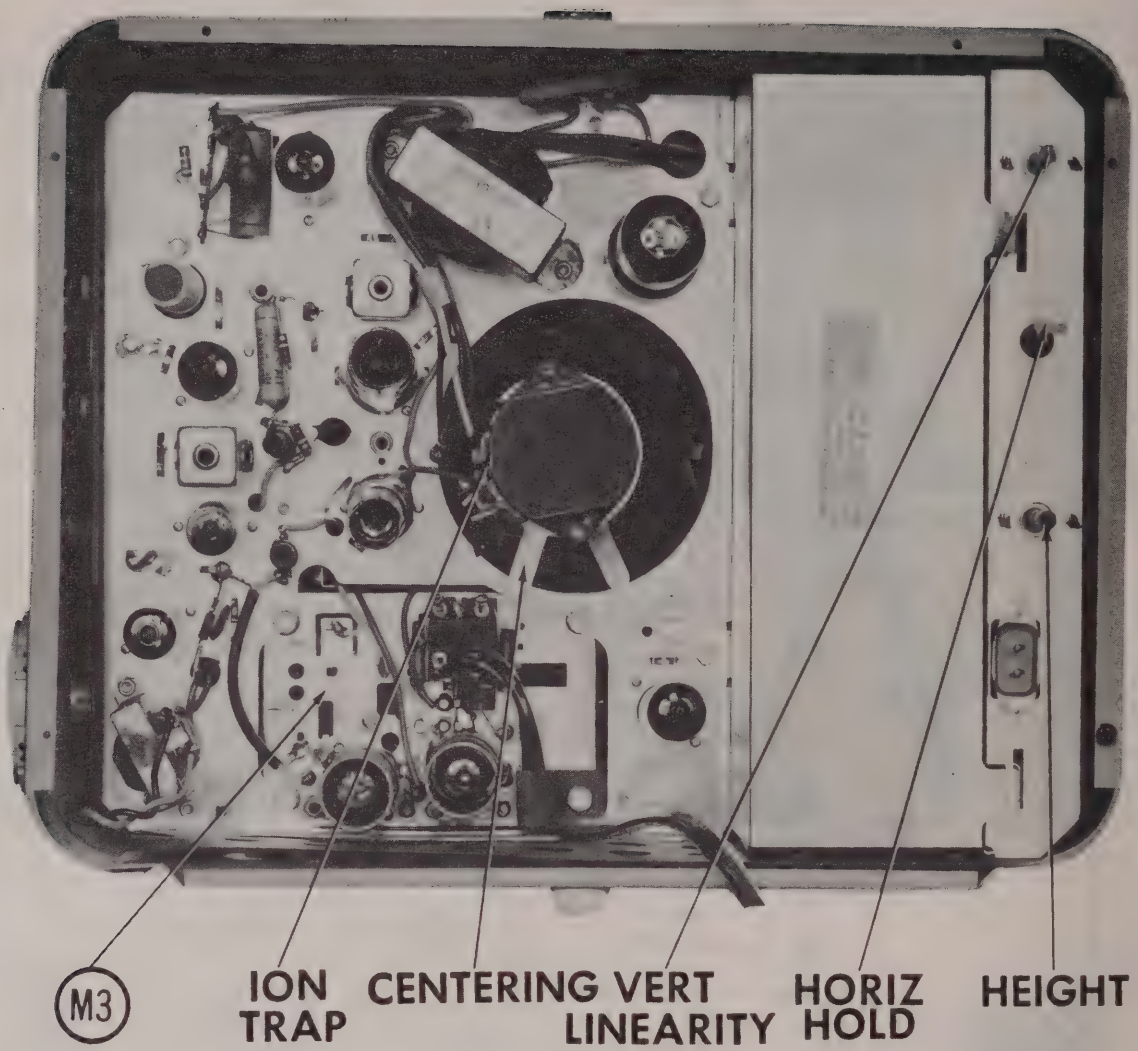


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Turn the set on and tune in a TV station, preferably with a test pattern.
2. Set the brightness and contrast controls for a normal picture.
3. Turn the horizontal hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.
4. Turn the horizontal hold slowly counter clockwise until the picutre just falls into sync.

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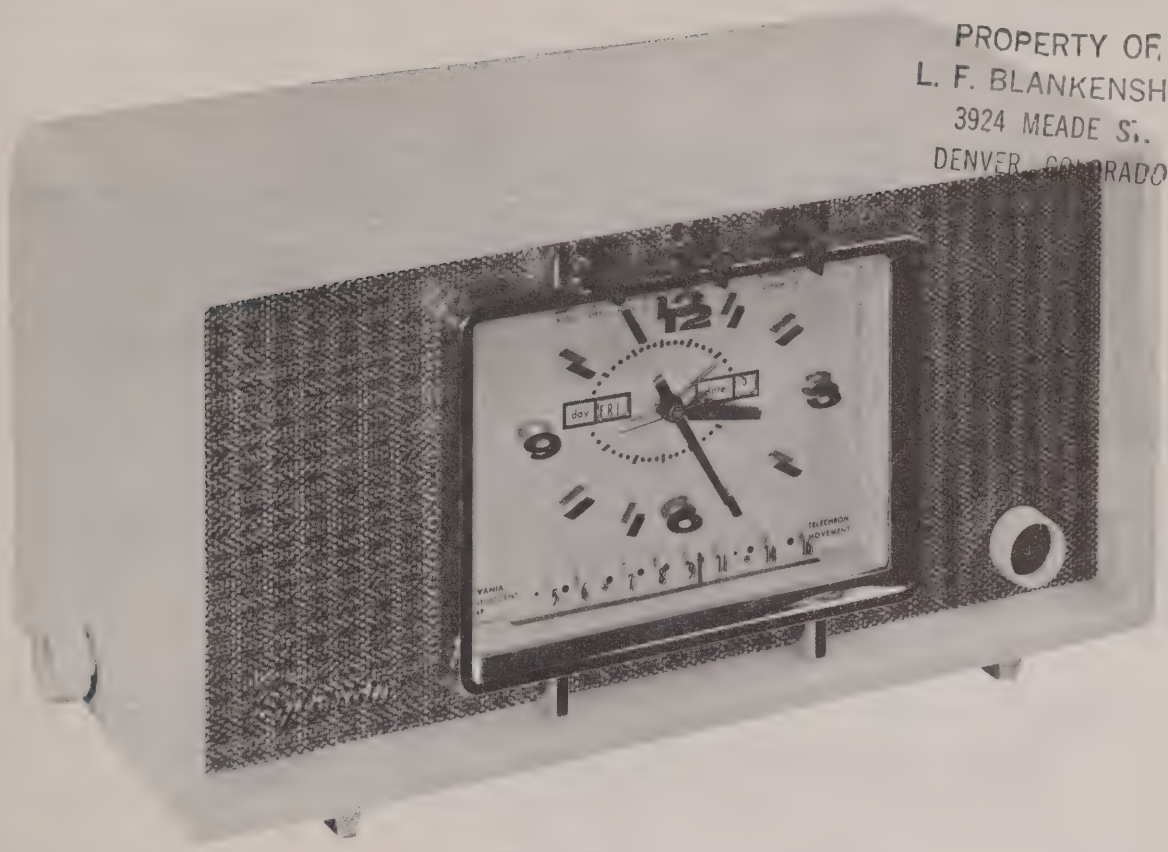
SYLVANIA MODELS
2302DG, H, PI (Ch. 1-602-9)



MODEL 2302H

TRADE NAME	Sylvania Models 2302DG, 2302H, 2302PI (Ch. 1-602-9)
MANUFACTURER	Sylvania Electric Prod., Inc., 700 Ellicott St., Batavia, N.Y.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AT6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles
RATING	.3 Amp. @ 117 Volts AC (30 Watts With Clock)
TUNING RANGE—BROADCAST	540KC - 1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal.	"	A6	"

PANELESCENT LAMP REPLACEMENT

1. Remove leads on top of lamp.
2. Set all clock hands at 12 o'clock. Carefully remove hands and plastic washer.
3. Release 4 buttons holding lamp to fiber board. It is not necessary to remove them. Remove lamp.
4. When reinstalling, position hands at 12 o'clock before sliding on shaft.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det-AVC-AF Amplifier	12AT6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150	161-2012	PRS150V4040	BBRD4415	TCD48	TDLD-7	FMD-1540	TVA-2445
B	40	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	100		166-0100P	SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C3	.047	400	160-06147	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C4	.022	400	160-06122	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C5	.047	400	160-06147	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C6	.047	400	160-06147	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C7	.047	400	160-06147	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	153-0106	B-60	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	FS-3	Not Req.	DS-36 ①	
R2A	500K	½	153-0043	AB-59	A47-500K-S	Q11-133	PTA55L	Panelescent Dimmer
B	Shaft			AK-19	RN-3	TQ	Not Req.	

① Special extension shaft for use with shaft of replacement control only.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

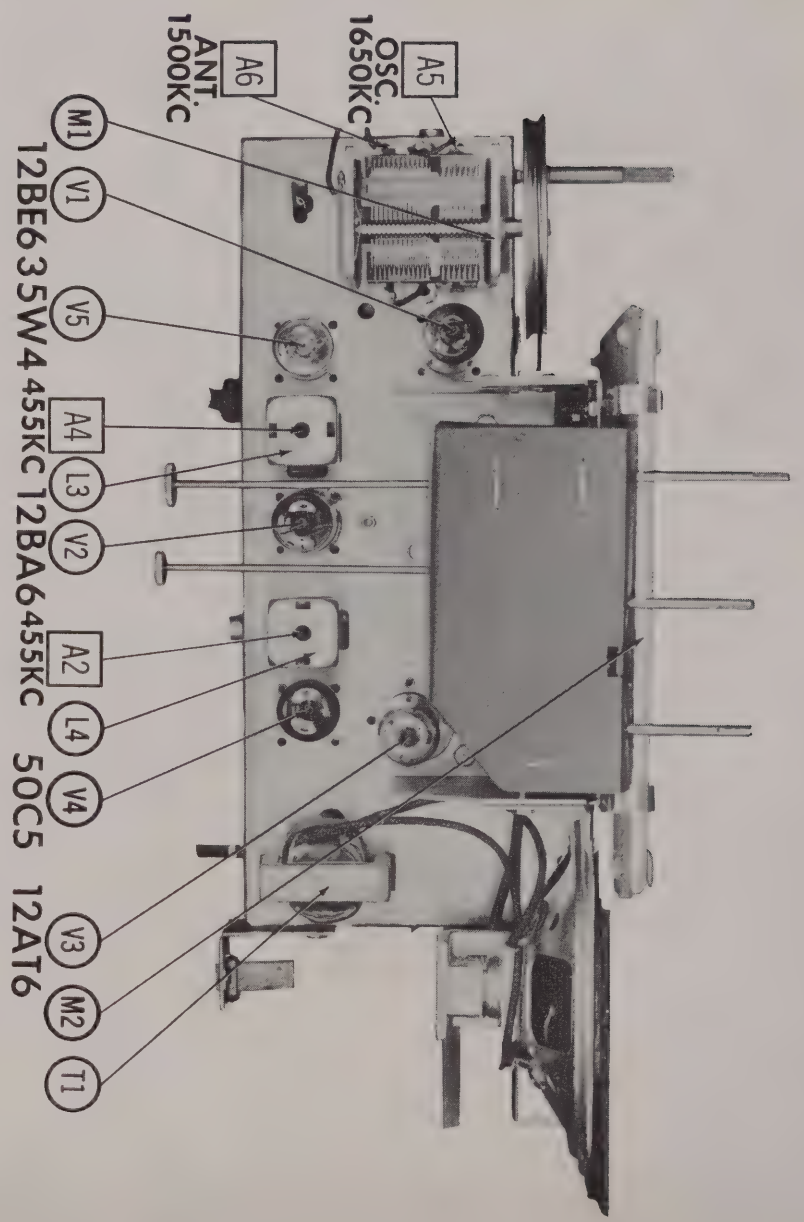
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R3	22Ω		181-0220	BTS-22	
R4	22K		181-0223	BTS-22K	
R5	2.2Meg		181-0225	BTS-2.2Meg	
R6	47K		181-0473	BTS-47K	
R7	82Ω		181-0820	BTS-82	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SYLVANIA PART No.	IRC PART No.	
R8	1200Ω	1	182-0122	BTA-1200	
R9	150Ω		181-0151	BTS-150	
R10	12K		181-0123	BTS-12K	
R11	12K		181-0123	BTS-12K	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2800Ω tapped	3-4Ω	143-0040	Z1103 ①	A-3031 ①	A-3336 ①	24S50A ①	S-16X ①	① Drill mtg. holes. Bend ears down.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	539-0403	4A07	

COILS (RF-IF)

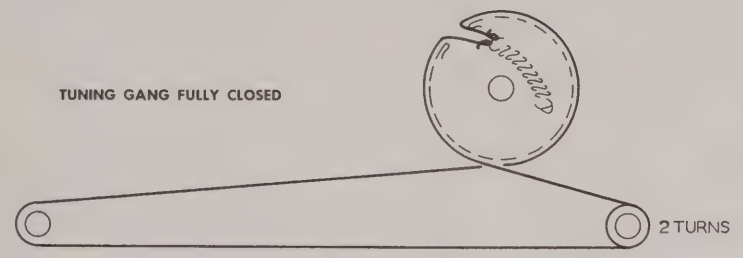
ITEM No.	USE	REPLACEMENT DATA				NOTES
		SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	582-0028				Includes cabinet back.
L2	Osc. Coil	113-0030	14-1077*			*Variable core.
L3	Input IF	121-0016	16-6758	BC-352	12-C1	
L4	Output IF	121-0016	16-6758	BC-353	12-C2	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	Audio -Det. Net.	125MMF, 5000MMF, 5000MMF, 250MMF, 10Meg, 470K, 470K	190-0026	

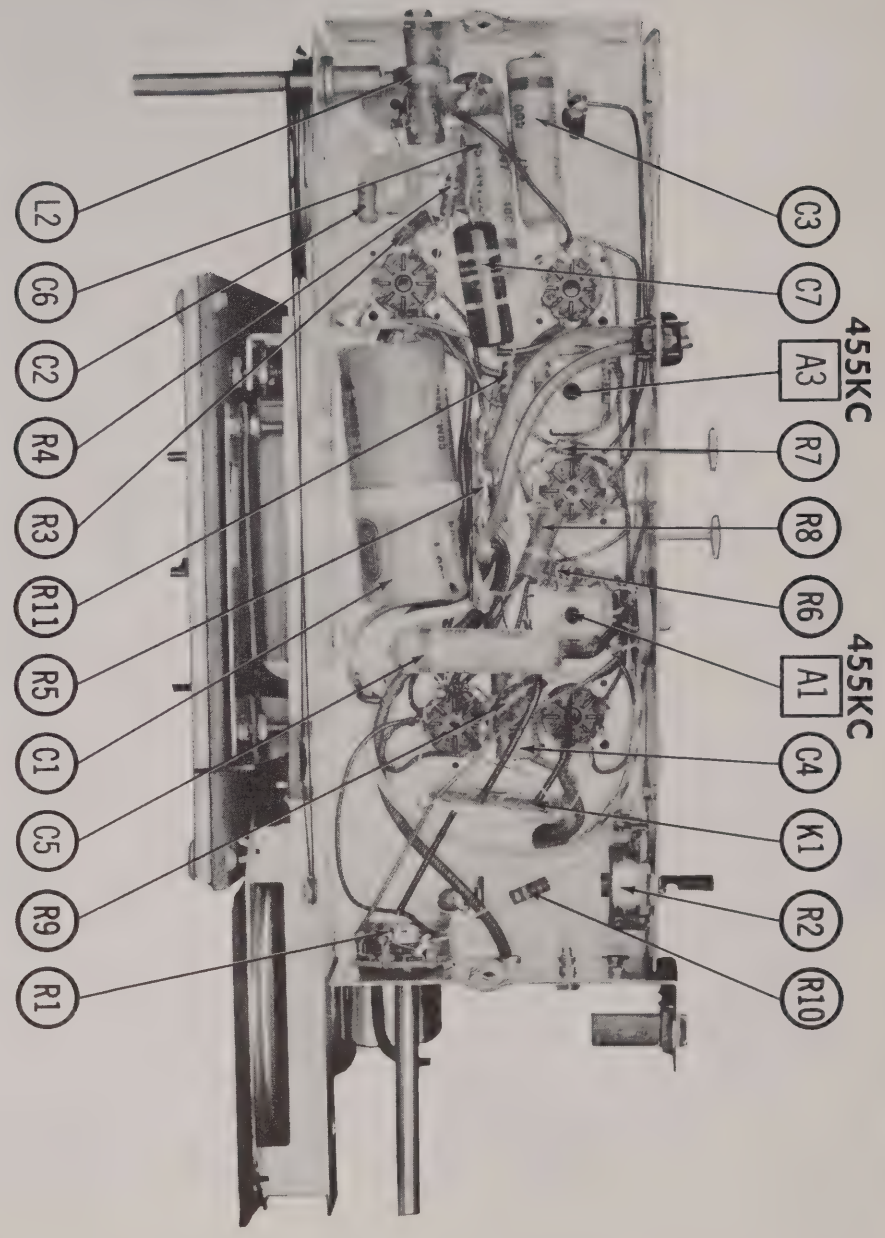
MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M1	Tuning Cap.	170-0018	Two Gang (20-355MMF, 16-105MMF)
M2	Clock Ass'y.		
M3	Lamp		Panelescent Unit
	Face	721-0015	Clock & Radio Dial
	Bezel	714-0042	Clock
	Pointer	792-0017	
	Knob	740-0123	Tuning, Model 2302DG.
	Knob	741-0037	Tuning, Model 2302PL.
	Knob	740-0129	Tuning, Model 2302H.
	Knob	740-0131	Volume, Model 2302DG.
	Knob	740-0132	Volume, Model 2302PL.
	Knob	740-0133	Volume, Model 2302H.
	Knob	740-0115	Alarm, Sleep.
	Knob	740-0120	Auto-On-Off-Manual.
	Cabinet	813-0104	Model 2302DG.
	Cabinet	813-0105	Model 2302PL.
	Cabinet	813-0106	Model 2302H.



DIAL CORD STRINGING

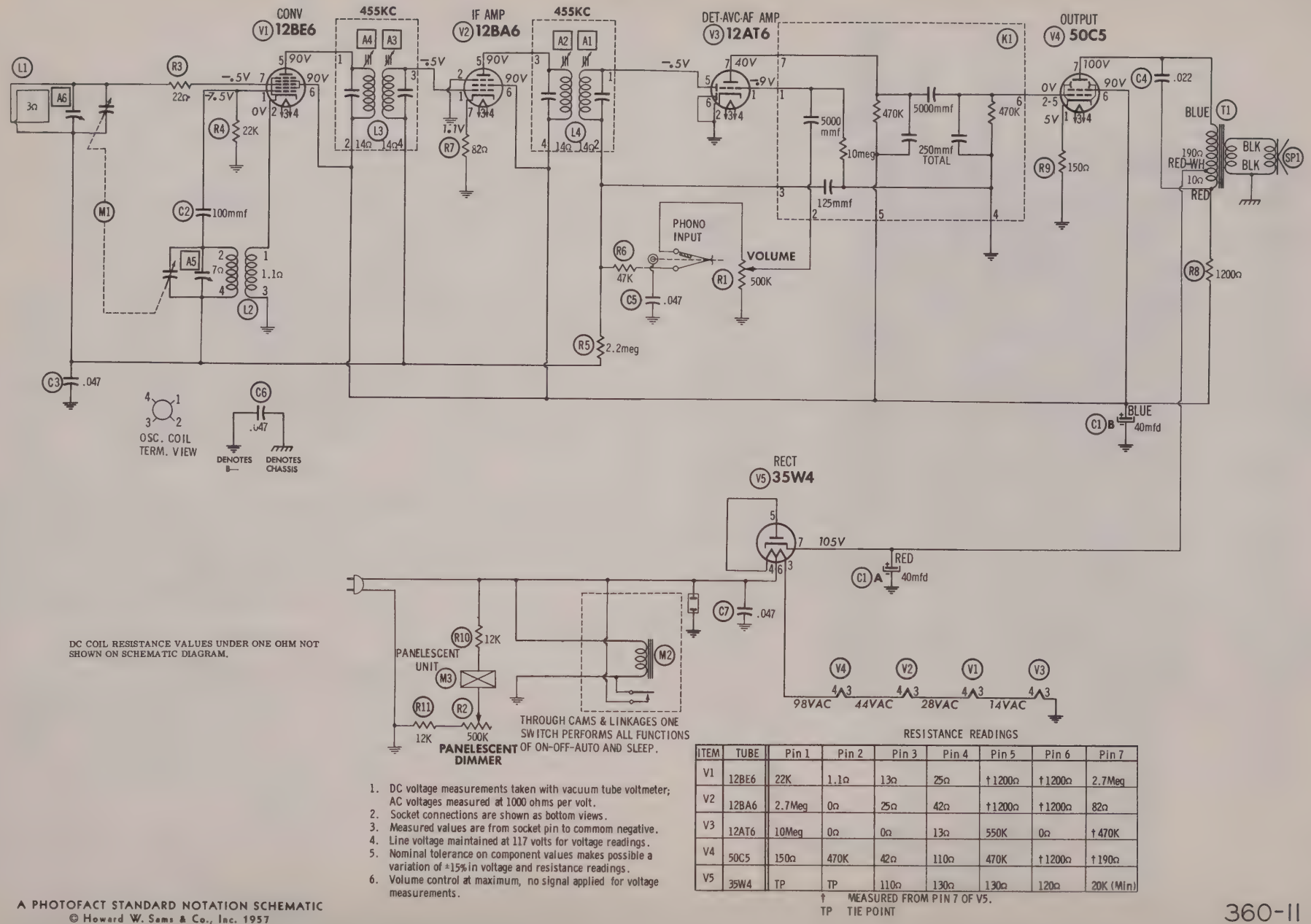
CHASSIS—BOTTOM VIEW



SET 360 FOLDER 11

SYLVANIA
MODEL 2302DG (Ch. 1-602-9)

SYLVANIA
MODEL 2302DG (Ch. 1-602-9)



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.1Ω	13Ω	25Ω	†1200Ω	†1200Ω	2.7Meg
V2	12BA6	2.7Meg	0Ω	25Ω	42Ω	†1200Ω	†1200Ω	82Ω
V3	12AT6	10Meg	0Ω	0Ω	13Ω	550K	0Ω	†470K
V4	50C5	150Ω	470K	42Ω	110Ω	470K	†1200Ω	†190Ω
V5	35W4	TP	TP	110Ω	130Ω	130Ω	120Ω	20K (Min)

† MEASURED FROM PIN 7 OF V5.
TP TIE POINT

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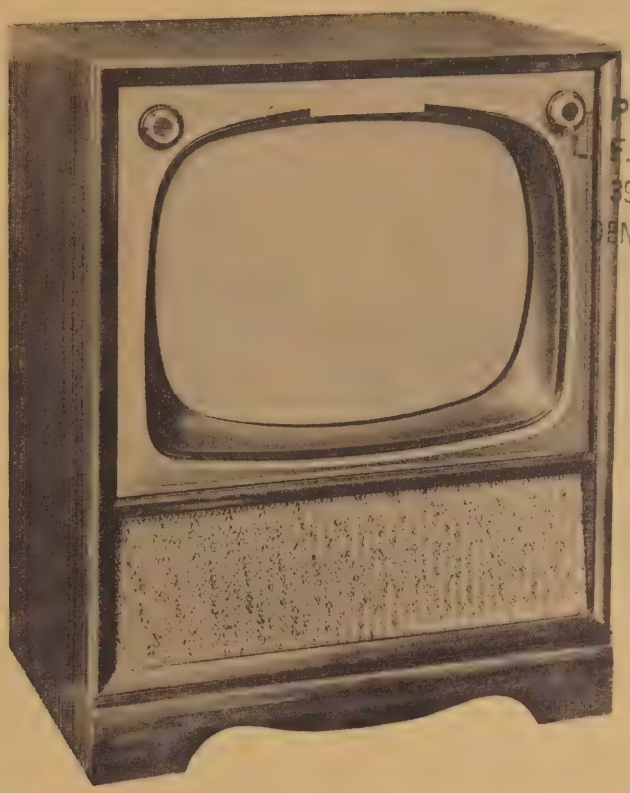

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WELLS-GARDNER MODEL 321A63U-B-678

TRADE NAME	Wells-Gardner, Models 321A63-B-622, 321A63-B-678, 2321A63-B-680 321A63U-B-622, 321A63U-B-678, 2321A63U-B-680
MANUFACTURER	Wells-Gardner Co., 2701 N. Kildare Avenue, Chicago 39, Illinois
TYPE SET	Television Receiver
TUBES	Twenty-One
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 195 Watts, 1.74 Amp. @ 117 Volts, AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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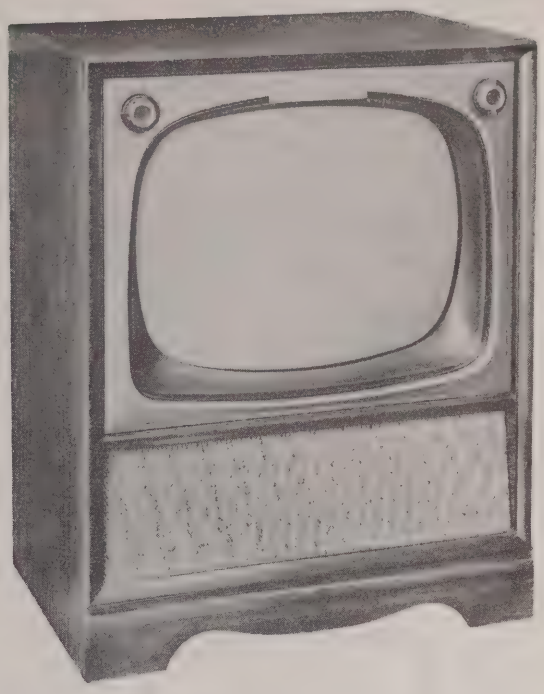

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 9 push-on type control knobs.
2. Remove 6 wood screws. Remove rear cover.
3. Loosen 4 wood screws holding 2 antenna terminal boards. Remove terminal boards.
4. Remove wood screw holding side chassis brace.
5. Remove 4 speaker wires.
6. Remove 6 speed nuts. Remove 2 speakers.
7. Remove 4 metal screws holding chassis to rear of cabinet.
8. Remove chassis.

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MODELS

321A63-B-622, 321A63-B-678, 2321A63-B-680
321A63U-B-622, 321A63U-B-678, 2321A63U-B-680

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

Remove nameplate by pulling outward. Remove 2 metal screws holding retainer. Remove safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

FOCUS

Adjust ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Turn the horizontal hold fully clockwise and adjust the horizontal frequency slug (B1) until the picture is just about to tear out of sync at the top. The picture should then be in good sync with the horizontal hold at center of its rotation. If not, continue to turn the slug until it starts to lose sync in the other direction.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control for maximum volume and MINIMUM buzz.

FUSES

One fuse is used for LV power supply protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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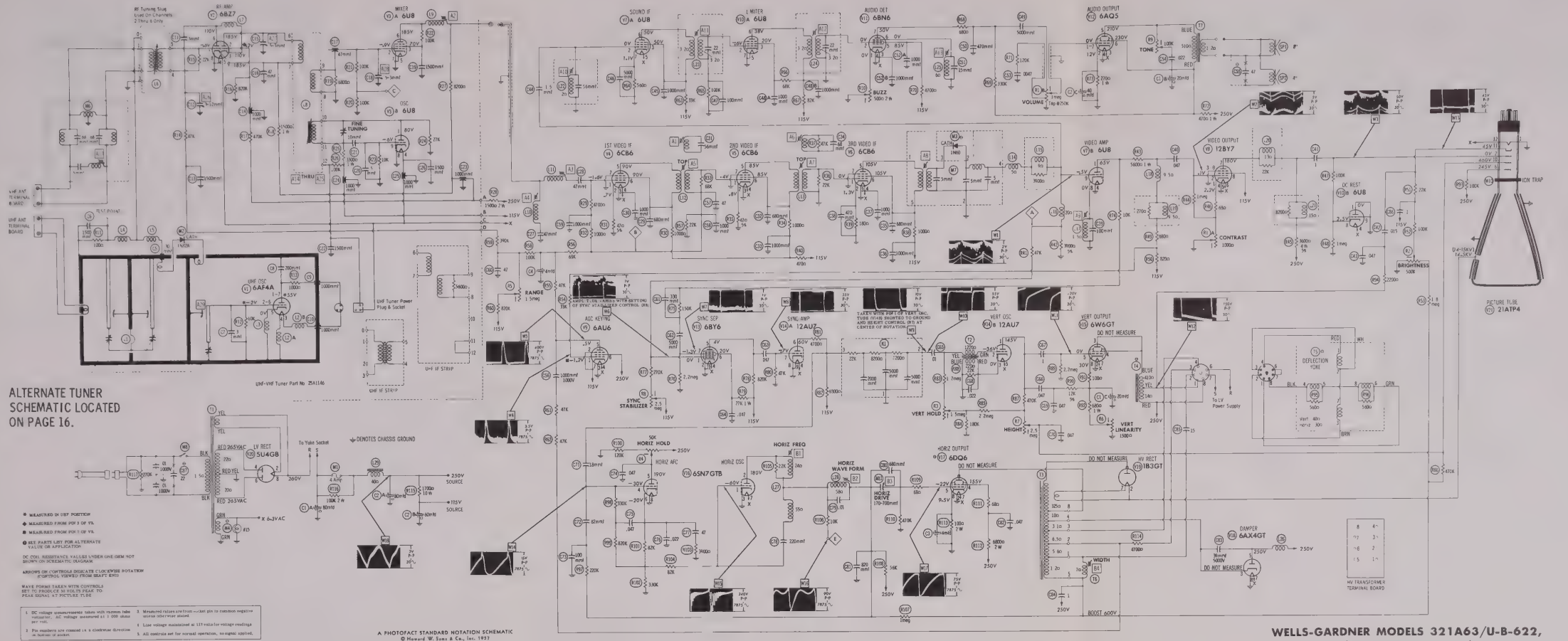
G871R

DATE 6-57 SET 360 FOLDER 12


ALTERNATE TUNER SCHEMATIC LOCATED ON PAGE 16.
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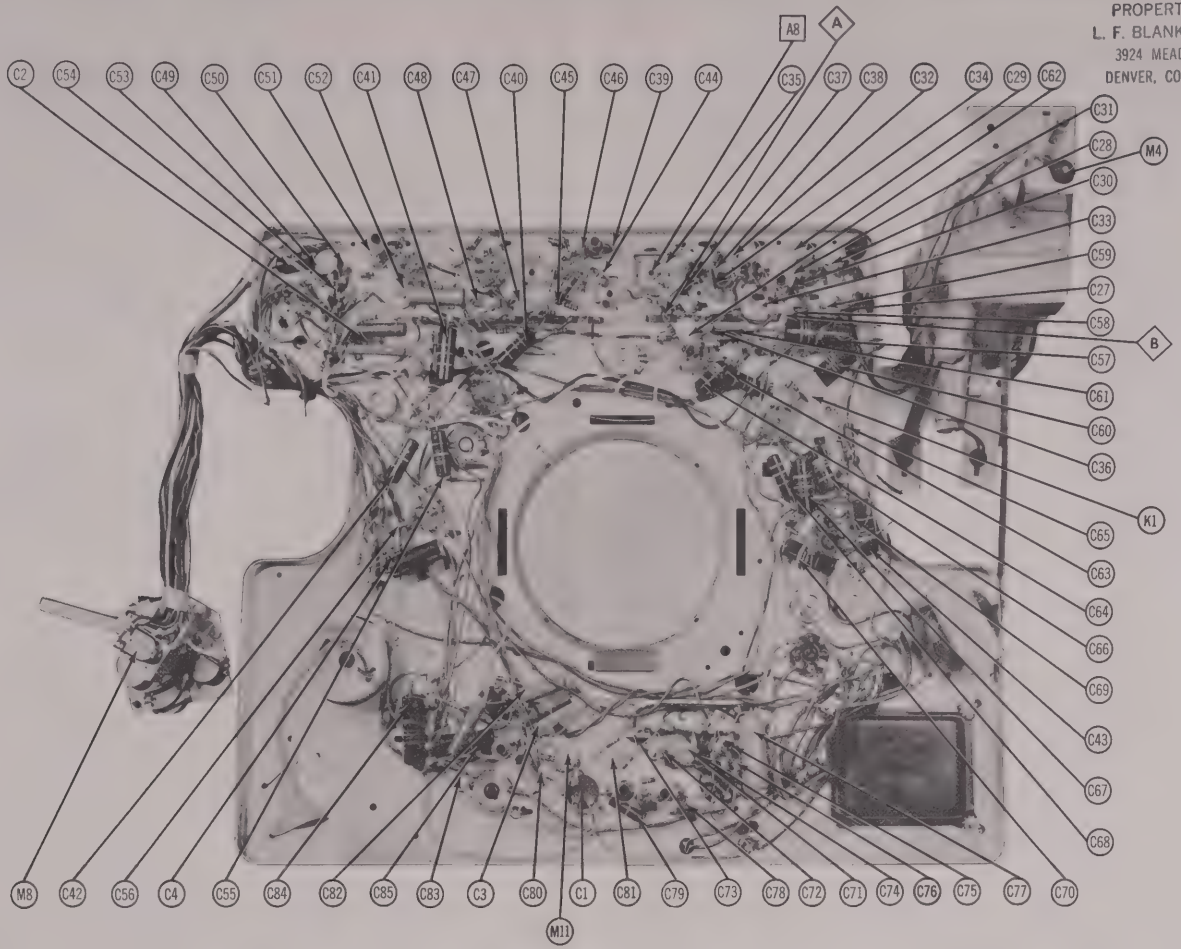
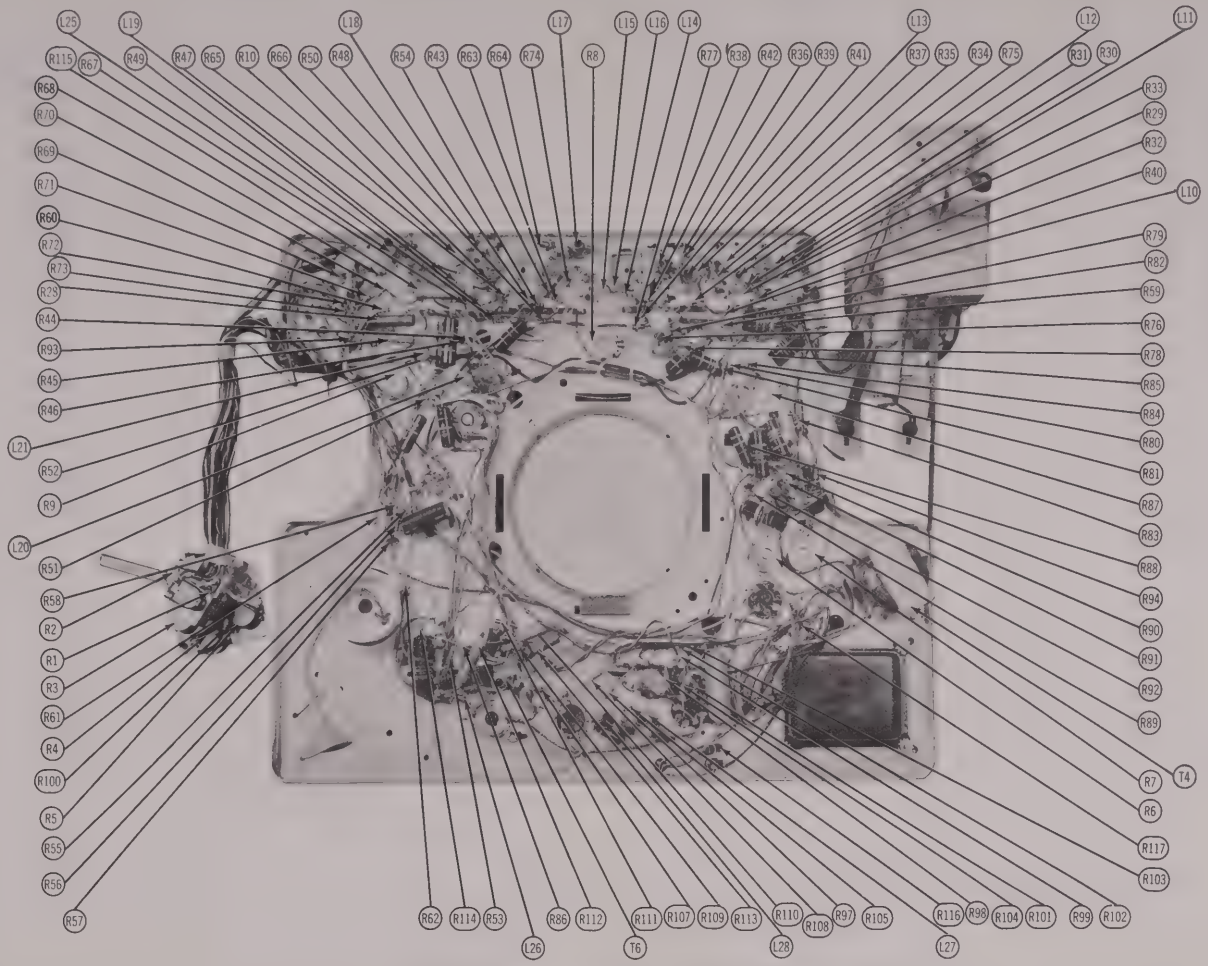


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUBE FAILURE CHECK CHART

TUBE FAILURE CHECK CHART

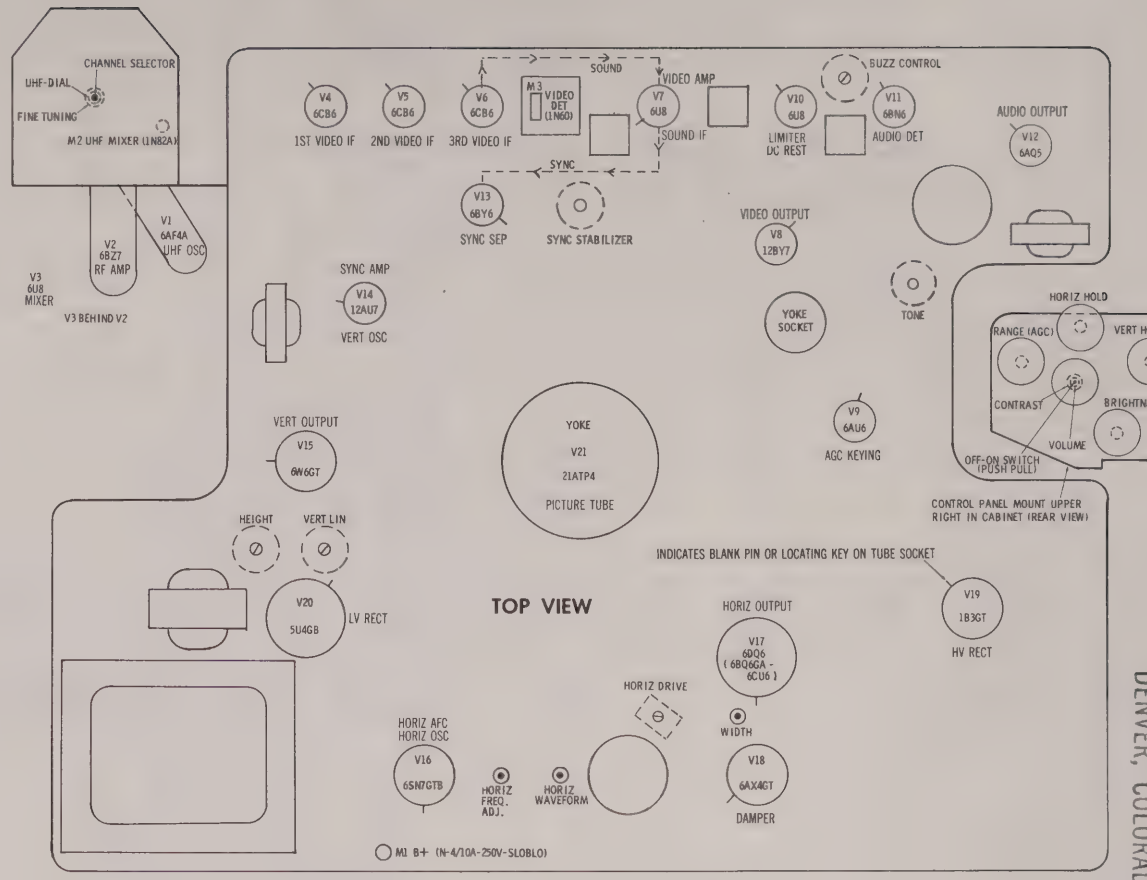
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - Fuse (M1), V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, Diode (M3), V9
No pic, no sound, has snow - V1 (UHF), V2, V3, V4
No pic, has sound, has raster - V7, V8, V10, V21
Has pic, no sound - V7, V10, V11, V12
Overloaded picture - V9

SYNC FAILURE
No vert. sync - V13, V14
No horiz. sync - V13, V14, V16
No vert. or horiz. sync - V13, V14

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V21
No vertical deflection - V14, V15
Poor vert. linearity or foldover - V14, V15
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V20
Vert. off freq. - V13, V14
Horiz. off freq. - V13, V14, V16



TUBE PLACEMENT CHART

WELLS-GARDNER MODELS 321A63/U-B-622, 321A63/U-B-678, 2321A63/U-B-680

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be taped and kept away from the chassis.

VIDEO IF ALIGNMENT

When aligning receivers employing tuner #25A1147 (Neutrode); connect the sweep generator with very short leads through 1000MMF disc ceramic to pin 9 (grid, accessible thru a hole located between the two tuner tubes) of the 6CG8 (mixer) tube. Low side to chassis.
When aligning other receiver, connect the high side of the generator to an ungrounded tube shield floating over the converter tube. Low side to chassis.
For all receivers, connect the negative lead of a 1.5 volt bias supply to Ⓑ. Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	See instructions above.		44MC (10MC Swp)	47.25MC	Any non-interfering channel.	Vert. amp. thru detector (Fig. 1) to pin 5 (Plate) of 6CB6 (V4). Low side to chassis.	A1	Adjust to place marker in trap notch as shown in Fig. 2.
2.	"	"	"	41.25MC 45.75MC	"	"	A2, A3, A4	Adjust A2 & A3 to shape top of response curve as in Fig. 2. Adjust A4 to correctly place 41.25MC marker at 40% as in Fig. 2. The 45.75MC marker must be correctly positioned or later adjustments will be incorrect. After desired response curve is obtained, do not change these adjustments.
3.	"	"	Not Used.	42.8MC (400∿ 30% AM Mod.)	"	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A5	Increase bias to -4.5 volts. Connect VTVM between point A and chassis and adjust generator output to produce -2 volts DC on meter. Remove VTVM. Adjust for maximum indication on scope.
4.	"	"	"	41.25MC	"	"	A6	Adjust for MINIMUM.
5.	"	"	"	45.3MC	"	"	A7	Adjust for maximum indication on scope.
6.	"	"	"	44.0MC	"	"	A8	"
7.	"	"	44MC (10MC Swp)	41.25MC 42.4MC 42.8MC 44.0MC 44.5MC 45.3MC 45.75MC 47.25MC	"	"		Check for response curve similar to Fig. 3. A8 controls the symmetry of top of curve. A7 will position 45.75MC marker. A5 is used to position 42.4MC marker. Retouch these adjustments only if necessary.

4.5MC TRAP ALIGNMENT

Connect the high side of the 4.5MC signal generator to point Ⓐ. Low side to chassis. Connect the AC probe of the VTVM to the cathode (pin 11) of the picture tube. Adjust A9 for MINIMUM deflection.
This adjustment may also be made by observing a picture from a station and adjusting A9 for MINIMUM 4.5MC beat interference in the picture.

SOUND IF ALIGNMENT

1. Tune in a TV station and reduce the signal with an attenuator between the antenna and the antenna terminals until a hiss accompanies the sound.
2. Adjust A10, A11, A12, A13 and the buzz control (R10) for maximum undistorted sound and MINIMUM buzz.
3. If hiss disappears during alignment, further reduce signal strength until the hiss returns.

VHF OSCILLATOR ALIGNMENT

Leave 4.5 volt bias connected as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 47K to point Ⓐ. Low side to chassis.	A14	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A15	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A16	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A17	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A18	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A19	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A20	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A21	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A22	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A23	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A24	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A25	

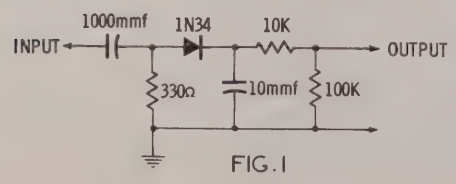


FIG. 1

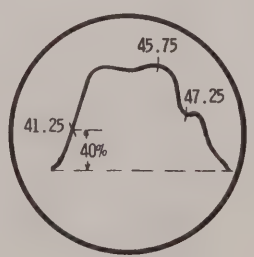


FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

VHF RF AND MIXER ALIGNMENT FOR TUNERS #25A1144 and #25A1146

Connect the negative lead of a 3 volt bias supply to AGC terminal (terminal "D" on tuner #25A1146 or terminal "A" on tuner #25A1144) on tuner terminal strip. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. thru 10K to point Ⓒ. Low side to chassis.	A26, A27, A28	Adjust for response curve similar to Fig. 5 with markers above 90%.
10.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel, make compromise adjustments of A26, A27 and A28 with channel switch set to that channel. Check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF OSCILLATOR ALIGNMENT

Adjust UHF oscillator trimmer (A29) for best uniform tracking over UHF band. Note: This does not necessarily mean that each UHF channel will appear at indicated number on knob.

INTERFERENCE TRAP ADJUSTMENT

Antenna trap (A30) should be adjusted for MINIMUM interference in the picture while receiver is tuned to channel where interference occurs.

VHF RF AND MIXER ALIGNMENT FOR TUNER #25A1147

Connect the negative lead of a 2.5 volt bias supply through 10K to the AGC terminal of tuner. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193.25MC 197.75MC	10	Vert. amp. thru 10K to point Ⓓ. Low side to chassis.	A31, A32	Adjust for maximum response similar to Fig. 5.
12.	"	"	"	"	"	"	A33	Adjust A33 (RF coil on channel 10 tuner strip) by expanding or compressing coil turns for maximum height between carriers. Retouch A31 and A32 for symmetrical response.
13.	"	"	"	"	"	Vert. amp. thru detector (Fig. 1) to pin 5 (plate) of 6CB6 (V4). Low side to chassis.	A34	Connect negative lead of 1.5 volt bias supply to point Ⓑ. Positive to chassis. Adjust A34 for MINIMUM response curve amplitude. Remove bias and test equipment.

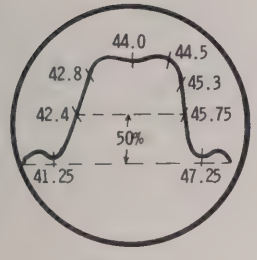


FIG. 3

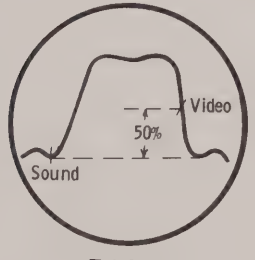


FIG. 4

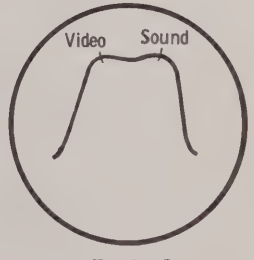
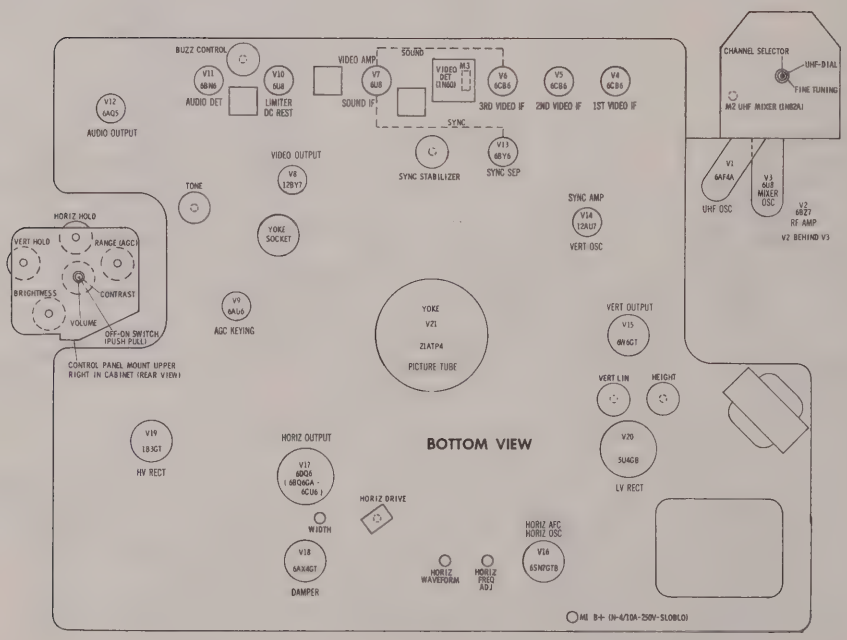


FIG. 5

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4	† *6000Ω	10K	.1Ω	0Ω	.1Ω	10K	† *6000Ω		
V2	6BZ7	† 3000Ω	290K	INF	0Ω	.1Ω	INF	570K	0Ω	† 3000Ω
V3	6U8	† 5000Ω	200K	† 100K	.1Ω	0Ω	† 9700Ω	0Ω	0Ω	10K
V4	6CB6	27K	47Ω	0Ω	.1Ω	† 3200Ω	† 3200Ω	0Ω		
V5	6CB6	22K	47Ω	0Ω	.1Ω	† 3200Ω	† 3200Ω	0Ω		
V6	6CB6	.1Ω	180Ω	0Ω	.1Ω	† 2700Ω	† 2700Ω	0Ω		
V7	6U8	† 8800Ω	2Ω	† 35K	0Ω	.1Ω	† 35K	560Ω	1.5Ω	3900Ω
V8	12BY7	• 85Ω	1Meg	0Ω	0Ω	0Ω	.1Ω	† 3600Ω	† 1700Ω	0Ω
V9	6AU6	† 35K	† 1700Ω	0Ω	.1Ω	140K	† 40Ω	† 1700Ω		
V10	6U8	0Ω	100K	† 150K	.1Ω	0Ω	† 82K	0Ω	1Meg	0Ω
V11	6BN6	• 2Ω	3.2Ω	.1Ω	0Ω	† 6500Ω	6Ω	† 330K		
V12	6AQ5	1Meg	270Ω	.1Ω	0Ω	† 1000Ω	† 510Ω	1Meg		
V13	6BY6	30K	0Ω	0Ω	.1Ω	† 820K	† 29K	2.2Meg		
V14	12AU7	• ‡ 1.3Meg	• 1.8Meg	220Ω	.1Ω	.1Ω	† 13K	47K	0Ω	0Ω
V15	6W6GT	TP	0Ω	† 450Ω	† 450Ω	2.2Meg	TP	.1Ω	• 1400Ω	
V16	6SN7GTB	410K	† 56K	0Ω	1.5Meg	• † 400Ω	410K	.1Ω	0Ω	
V17	6DQ6	TP	0Ω	NC	† 6800Ω	470K	TP	.1Ω	100Ω	TOP CAP ‡ 10Ω
V18	6AX4GT	NC	NC	650K	NC	† 40Ω	NC	.1Ω	0Ω	
V19	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡ 335Ω
V20	5U4GB	NC	90K	NC	22Ω	NC	20Ω	NC	90K	
V21	21ATP4	0Ω	1.1Meg	Pin 6 † 100K	Pin 10 ‡ 470K	Pin 11 • 360K	Pin 12 1Ω			

- • THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.
- ‡ MEASURED FROM PIN 3 OF V18.
- † MEASURED FROM PIN 8 OF V20.
- * MEASURED IN "UHF" POSITION.
- TP TIE POINT
- NC NO CONNECTION



TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CHASSIS TOP VIEW

WELLS-GARDNER MODELS 321A63/U-B-622,
321A63/U-B-678, 2321A63/U-B-680

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES	ITEM No	USE	TYPE	NOTES
V1	UHF Osc.	6AF4		V5	Audio Det.	6BN8	
V2	RF Amp.	6BZ7		V13	Audio Output	6AQ5	
V3	Mixer-Osc.	6L8		V3	Sync Amp.	6BY6	
V4	1st Video IF Amplifier	6CB6		V14	Sync Amp.-Vert. Osc.	12AU7	
V5	2nd Video IF Amplifier	6CB6		V15	Vert. Output	6W6GT	
V6	3rd Video IF Amplifier	6CB6		V16	Horiz. AFC-Horiz. Osc.	6SN7GTB	
V7	Video Amp.-Sound IF Amp.	6L6	Note 1	V17	Horiz. Output	6DQ6B	
V8	Video Output	12BY7		V18	Damper	6AX4GT	
V9	AGC-Keying	6AL5		V19	HV Rectifier	1B3GT	
V10	Limiter-DC Restorer	6L6		V20	LV Rectifier	5U4GB	

Note 1: Some versions may use 6CU6 or 6BQ6GA in this application.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				
	Wells-Gardner PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES	
V21	21ATP4	21ATP4 1	21ATP4A 2 21ATP4B 2 21ATP4C 2 21HP4	1 Aluminized 2 Silver Screen "88"	

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	Wells-Gardner PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	300	45X428	AFH4-07	DA350 DBR20-50	FP-335 TC-36	TMT-25 TD-10-50	Q-QU MT-0510	R1203*
B	80	300							
C	10	50						T-180	
C3A	80	300	45X429	AFH3-29-50	DO354 UH4015	P-2227.5 TC68		MT-0550	R1204*
B	60	300							
C	40	50							
C3	4	50	45X418	PRS150V4	BBR-4-50	TC30	TD-4-50	MMT-0505	TVA-1303
C4	4	50	45X418	PRS150V4	BBR-4-50	TC30	TD-4-50	MMT-0505	TVA-1303

* Non catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REPLACEMENT DATA							
	CAP	VOLT	Wells-Gardner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	30		13M30GP300KN02							
C6	1500		15LEXA15Z5	BPD-0015	DD-153	BYAI3DE5	ED-0015	DCS315	5HK-D15	
C7	3									
C8	200									
C9	1000		13M330EA102Z-01	EF-001	MPT-1000				503C-D1	
C10	1000		13M330EA102Z-01	EF-001	MPT-1000				503C-D1	
C11	3		15LSC03E	NPO-S33	TCZ-S33	C10Y3C	TCO-3		ET-S33	
C12	2-12		31B901							
C13	1500		15LEXA15Z5	BPD-0015		BYAI3DE5	ED-0015	DCS315	5HK-D15	
C14	1000		13M236N02Z	EF-001	MPT-1000				503C-D1	
C15	5-3		31B903		536-3			31S-D	CT55A	
C16	47		15LSQ47K							
C17	47		13M201U470K-R							
C18	5-3		31B903		536-3			31S-D	CT55A	
C19	1500		15LEXA15Z5	BPD-0015	DD-153	BYAI3DE5	ED-0015	DCS315	5HK-D15	
C20	5		15LEUA50C							
C21	10		15LEU10F							
C22	1500		15LEXA15Z5	BPD-0015	DD-153	BYAI3DE5	ED-0015	DCS315	5HK-D15	
C23	1000		13M236N02Z	EF-001	MPT-1000				503C-D1	
C24	1000		13M236N02Z	EF-001	MPT-1000				503C-D1	
C25	1000		13M236N02Z	EF-001	MPT-1000				503C-D1	
C26	1500		15LEXA15Z5	BPD-0015	DD-153	BYAI3DE5	ED-0015	DCS315	5HK-D15	
C27	47		DI-47	D8-470	LT8Q47	GP-47	UC-5447		5GA-Q47	
C28	47		DI-47	D8-470	LT8Q47	GP-47	UC-5447		5GA-Q47	
C29	1000		BPD-00068	DI-681	BYAI0T68	ED-680	UC-5368		5GA-T68	
C30	1000		BPD-001	DI-102	BYA1DI	ED-1000	DC521		5HK-D1	
C31	56		NPO-S56	TCZ-56	C10Q56C	TCO-56				
C32	680		BPD-00068	DI-681	BYAI0T68	ED-680	UC-5368		5GA-T68	
C33	1000		BPD-001	DI-102	BYA1DI	ED-1000	DC521		5HK-D1	
C34	68		NPO-S68	TCZ-68	C10Q68C	TCO-68				
C35	680		90X15	BPD-00068	DI-681	BYAI0T68	ED-680	UC-5368	5GA-T68	
C36	1000		BPD-001	DI-102	BYA1DI	ED-1000	DC521		5HK-D1	
C37	1000		BPD-001	DI-102	BYA1DI	ED-1000	DC521		5HK-D1	
C38	470		90X4	BPD-00047	DI-471	BYAI0T47	ED-470	UC-5347	5GA-T47	
C39	100			DI-101		LT5T1	GP-100	UC-531	5GA-T1	
C40	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C41	1	400		P48M-1	DF-104	CUB4P1		GEM-401	47M-P1	
C42	015	600	RCP10M6153M	BPD-015	DD-153	CUB6S15	ED-015	GEM-6115	47M-S15	
C43	047	600	RCP10M6473M	BPD-05	DF-503	CUB6S47		GEM-6147	47M-S47	
C44	5			WPD-51.5	TCZ-5R5	C10V5C	TCO-1.5		5TCCB-V15	
C45	1000			BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C46	5000			BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C47	100			DI-100		LT4T1	GP-100	UC-531	5GA-T1	
C48A	1000		90X3	BPD-1000	DD3-103	BYC6DD1	ED-1000	DCD521	5HK-XD1	
B	1000						ED-1000L			
C49	5000			BPD-005	DD-503	BYA10D5	ED-005	DC525	5HK-D5	
C50	470		90X4	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	
C51	15			BPD-000015	DD-150	LU4J	ED-015	UC-5415	5GA-Q15	
C52A	1000		83G1		DD3-103	BYC6DD1	ED-1000	DCD521	5HK-XD1	
B	1000						ED-1000L			
C53	0047	400	RCP10M4473M	BPD-0047	DD-473	CUB4D47	ED-0047	GEM-4147	47M-D47	
C54	023	300	RCP10M2323M	BPD-03	DF-303	CUB2S23	ED-03	GEM-2123	27M-S23	
C55	47	200	RCP10M2474M	P28M-47		CUB2P47		GEM-2147	27M-P47	Note 1
C56	1000	300	47X783	RVD-15-1000		BYA10DLM		DC1021	10HKB-D1	
C57	47	200	RCP10M2474M	P28M-47		CUB2P47		GEM-2047	27M-P47	
C58	1000			BPD-001	DD-122	BYA5D1	ED-1000	DC521	5HK-D1	
C59	1000			BPD-001	DD-103	BYA6D1	ED-1000	DC521	5HK-D1	
C60	47	200	RCP10M2474M	P28M-47		CUB2P47		GEM-2047	27M-P47	
C61	15			1489-00033		5R6T33			MB-S33	
C62	5000			BPD-005	DD-503	BYA10D5	ED-005	DC525	5HK-D5	
C63	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C64	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C65	01	400		BPD-01	DD-103	CUB4S1	ED-01	GEM-411	47M-S1	
C66	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C67	1	400		P48M-1	DF-104	CUB4P1		GEM-401	47M-P1	
C68	023	300	RCP10M2323M	BPD-03	DF-303	CUB2S23	ED-03	GEM-2123	27M-S23	
C69	047	200	RCP10M2473M	BPD-05	DF-503	CUB2S47		GEM-2147	27M-S47	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No	RATING		REPLACEMENT DATA							
	CAP	VOLT	Wells-Gardner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C70	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C71	18		RCM20B180K	1469-00018		22S5Q18			MS-418	
C72	82		RCM20B820K	1469-00082		22S8Q82			MS-482	
C73	100			1469-0001		22S7T1		MC335	MS-3	
C74	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C75	047	200	RCP10M2473M	BPD-05	DF-503	CUB2S47		GEM-2147	27M-S47	
C76	023	300	RCP10M2323M	BPD-03	DF-303	CUB3S23	ED-03	GEM-3123	37M-S23	
C77	47	300	RCP10M2474M	P28M-47		CUB3P47		GEM-3047	37M-P47	
C78	220			1469-00022		22S8T22			MS-422	
C79	01	400		BPD-01		CUB4S1		GEM-41	47M-S1	
C80	680			BPD-00068	DD-681	BYAI0T68	ED-680	UC-5368	5GA-T68	
C81	820		RCM20B820K	1464-00082		1R8T82			MS-382	
C82	047	400	RCP10M4473M	BPD-05	DF-503	CUB4S47		GEM-4147	47M-S47	
C83	39	5000	47X798			BYA5D39				
C84	1	600		P68M-1	DF-104	CUB6P1		GEM-601	67M-P1	
C85	15	200		P28M-15		CUB2P15		GEM-2015	27M-P15	
C86	1	200		P28M-1	DF-104	CUB2P1		GEM-201	27M-P1	
C87	33	400		P48M-22		CUB4P33		GEM-4022	47M-P22	Note 1

Note 1: Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Wells-Gardner PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1000Ω	½	78X37					Contrast
B	1Meg	½						Volume - Tap@ 250K
R2A	500K	½	40X618	AB-09	A47-500K-S	QU-133	U50	Brightness
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
R3A	1. 5Meg	½	40X416	AB-742	A47-1.5Meg-S	QU-158	U155	Vert. Hold
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
R4A	50K	½	40X414	AB-31	A47-50K-S	QU-133	U35	Horiz. Hold
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
R5A	1. 5Meg	½	40X415	AB-743	A47-1.5Meg-S	QU-158	U165	Range
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
R6A	1000Ω	½	40X410	AB-8	A47-1000-S	QU-109	PTA15L	Vert. Lin.
B	Shaft			AK-4	FKS-1/2	NQ	Not Req.	
R7A	2. 5Meg	½	40X405	AB-03	A47-2.5Meg-S	QU-339	TA255L	Height
B	Shaft			AK-4	FKS-1/2	NQ	Not Req.	
R8A	2. 5Meg	½	40X405	AB-53	A47-2.5Meg-S	QU-339	TA255L	Sync Stab.
B	Shaft			AK-4	FKS-1/4	NQ	Not Req.	
R8A	100K	½	40X407	AB-40	A47-100K-S	QU-138	TA35L	Tone
B	Shaft			AK-4	FKS-1/4	NQ	Not Req.	
R10	5000	3	40X397	39-500			FL-500	Beam (Wire-wound)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING		REPLACEMENT DATA			
	OHMS	WATT	Wells-Gardner PART No.	IRC PART No.		NOTES
R11	100Ω		12TA5100K	BTS-100		
R12	10K		12TA5103K	BTS-10K		
R13	1000Ω		31S-563	BTS-1000		
R14	47K		12TA5473M	BTS-47K		
R15	22K		12TA5223K	BTS-22K		
R16	820K		12TA5824K	BTS-820K		
R17	470K		12TA5474K	BTS-470K		
R18	1500Ω	1	15BA5152K	BTA-1500		
R19	680Ω	1	15BA5681K	BTA-680		
R20	100K		12TA5104K	BTS-100K		
R21	100K		12TA5104K	BTS-100K		
R22	100K		12TA5104K	BTS-100K		
R23	10K		12TA5103M	BTS-10K		
R24	27K		12TA5273K	BTS-27K		
R25	3300Ω	1	15BA5332K	BTA-3300		
R26	100K		12TA5104K	BTS-100K		
R27	8200Ω			BTS-8200		
R28	1000Ω	2		BTS-1000		
R29	4700Ω					
R30	1000Ω		31S-563	BTS-1000		
R31	470 5%			BTS-47 5%		
R32	1000Ω					
R33	68K			BTS-68K		
R34	1000Ω		31S-563	BTS-1000		
R35	470 5%			BTS-47 5%		
R36	22K			BTS-22K		
R37	47K			BTS-47K		
R38	1000Ω			BTS-1000		
R39	180Ω			BTS-180		
R40	470Ω			BTS-470		
R41	47K					
R42	3300Ω 5%			BTA-3300		
R43	5600Ω	1				
R44	1Meg					
R45	3300Ω 5%	4	43X331			
R46	68Ω			BTS-68		
R47	100K			BTS-100K		
R48	1Meg			BTS-1Meg		
R49	680Ω			BTS-680		
R50	820Ω			BTS-820		
R51	33K			BTS-33K		
R52	100K			BTS-100K		
R53	1. 5Meg			BTS-1. 5Meg		
R54	33K			BTS-33K		
R55	47K			BTS-47K		
R56	68K			BTS-68K		
R57	33K			BTS-33K		
R58	100K			BTS-100K		
R59	390K			BTS-390K		
R60	820K			BTS-820K		
R61	47K			BTS-47K		
R62	47K			BTS-47K		
R63	33K			BTS-33K		
R64	680Ω			BTS-680		

ITEM No	RATING		REPLACEMENT DATA			
	OHMS	WATT	Wells-Gardner PART No.	IRC PART No.		NOTES
R65	100K			BTS-100K		
R66	68K			BTS-68K		
R67	82K			BTS-82K		
R68	680Ω			BTS-680		
R69	330K			BTS-330K		
R70	470Ω			BTS-470		
R71	120K			BTS-120K		
R72	470Ω	1		BTA-470		
R73	270Ω	1		BTA-270		
R74	150			BTS-150		
R75	150K			BTS-150K		
R76	2. 2Meg			BTS-2. 2Meg		
R77	470K			BTS-470K		
R78	820K			BTS-820K		
R79	27K			BTS-27K		
R80	47K			BTS-47K		
R81	4700Ω			BTS-4700		
R82	680Ω			BTS-680		
R83	1. 2Meg			BTS-1. 2Meg		
R84	180K			BTS-180K		
R85	2. 2Meg			BTS-2. 2Meg		
R86	470K			BTS-470K		
R87	470K			BTS-470K		
R88	22K			BTS-22K		
R89	2. 2Meg			BTS-2. 2Meg		
R90	12K 5%			BTS-12K 5%		
R91	100Ω	1		BTS-100		
R92	680Ω	1		BTA-680		
R93	100K			BTS-100K		
R94	2200Ω			BTS-2200		
R95	560Ω					
R96	560Ω					
R97	330K					
R98	330K					
R99	330K					
R100	120K					
R101	82K					
R102	330K					
R103	390Ω					
R104	100Ω					
R105	680Ω	2				
R106	100Ω	3				
R107	1Meg					
R108	56K					
R109	68Ω			BTS-68		
R110	470K			BTS-470K		
R111	68Ω			BTS-68		
R112	680Ω	2		BTS-680		
R113	100Ω	3		BTS-100		
R114	4700Ω					
R115	1700Ω	10	43X894	1 3/4A-1750		
R116	100K	2		BTS-100K		
R117	470K			BTS-470K		

TRANSFORMER (POWER)

ITEM No	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Wells-Gardner PART No	Hallodrson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	117VAC	525VCT	5V	6. 3V	53X354-A		P-2830 1	P-8332 2	25R68 1	R-61BC 1
	p. 1. 5A	p. 270A	p. 3A	p. 2. 0A						

1) Parallel & phase 6. 3V, 6A filament windings.
2) Tape 5. 3V, 1. 35A filament winding.
3) Parallel & phase 5. 3V filament windings.
4) Tape 5. 3V, 1. 2A filament winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE		Wells-Gardner PART No.	REPLACEMENT DATA				NOTES
	PRI.	SEC.		Hallodrson PART No.	Merit PART No.	Thordarson PART No.	Triad PART No.	
T7	8300Ω	8-8Ω	51X181	Z1000 ①	A-3800 ①	A-38561	24B80 ①	8-51X ①

① Tape center tap on primary winding.

SPEAKER

ITEM No.	TYPE					REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C	IMP		Wells-Gardner PART No	QUAM PART No.	
SP1	8"	PM	6-8Ω			12A539 ①	8A426 ⑤	① Used in console models.
	8"	PM	3-4Ω			12A538 ②		② Used in table models.
SP2	4"	PM	6-8Ω			12A537 ③	4A0726 ③	③ Connect in parallel and phase.

COILS (RF-IF)

ITEM No	USE	Wells-Gardner PART No.	NOTES
L1	UHF RF		
	Coupling Coil	31S-02E	
L2	Fil. Choke	31K-137-018	
L3	Cath. Choke	31K-137-018	
L4	RF Choke	31K-137-018	
L5	RF Choke	31K-137-014	
L6A	Ant. Coils	31M-013. 1U	Channel 1 - Includes complete 6MC coil board assembly.
B	Ant. Coils	31M-013. 2U	Channel 2
C	Ant. Coils	31M-013. 3U	Channel 3
D	Ant. Coils	31M-013. 4U	Channel 4
E	Ant. Coils	31M-013. 5U	Channel 5
F	Ant. Coils	31M-013. 6U	Channel 6
G	Ant. Coils	31M-013. 7U	Channel 7
H	Ant. Coils	31M-013. 8U	Channel 8
I	Ant. Coils	31M-013. 9U	Channel 9
J	Ant. Coils	31M-013. 10U	Channel 10
K	Ant. Coils	31M-013. 11U	Channel 11
L	Ant. Coils	31M-013. 12U	Channel 12
M	Ant. Coils	31M-013. 13U	Channel 13
L7	Cath. Choke	31M-727	

ITEM No	USE	Wells-Gardner PART No	NOTES
L8B	RF, Mixer Grid & Osc. Coils	31M-113. 2U	Channel 2
C	RF, Mixer Grid & Osc. Coils	31M-113. 3U	Channel 3
D	RF, Mixer Grid & Osc. Coils	31M-113. 4U	Channel 4
E	RF, Mixer Grid & Osc. Coils	31M-113. 5U	Channel 5
F	RF, Mixer Grid & Osc. Coils	31M-113. 6U	Channel 6
G	RF, Mixer Grid & Osc. Coils	31M-113. 7U	Channel 7
H	RF, Mixer Grid & Osc. Coils	31M-113. 8U	Channel 8
I	RF, Mixer Grid & Osc. Coils	31M-113. 9U	Channel 9
J	RF, Mixer Grid & Osc. Coils	31M-113. 10U	Channel 10
K	RF, Mixer Grid & Osc. Coils	31M-113. 11U	Channel 11
L	RF, Mixer Grid & Osc. Coils	31M-113. 12U	Channel 12
M	RF, Mixer Grid & Osc. Coils	31M-113. 13U	Channel 13

TRANSFORMER (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA						
		Wells-Gardner PART No.	Hallodrson PART No.	Merit PART No.	RCA PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	54X10	19T02	A-3003	29T11 1	V405	A-8125	26A03
T3	Horiz. Output Trans.	53X355	FB410 4 HF800*5 1	HVU-36 4 MWC-11*5 1	32S11 4 212R1*5 1	X094 4 20IR16*5 1	A-8253 * D 5	FLY-16 4 WC-18*5 1
T4	Vert. Output Trans.	51X173A	21W00 3	A-2823 1		V302 1	A-8148 3	26S72 1
		51X173 2	21W00 3	A-2823 1		V302 1	A-8148 3	26S72 1
T5A	Yoke(90°)Horiz(30MH)	9A2388-1B 5	DY80T 3	MDY-92 3	23SDY 3	DY-86 3	DY-16A 3	DY-16 3
B	Vert(39MH)	9A2388 2		T 3				T 3
T6	Width Coil (1-9MH)	9A238I	RF802 4	MWC-8	21LR1	20UR16	WC-8	WC-32

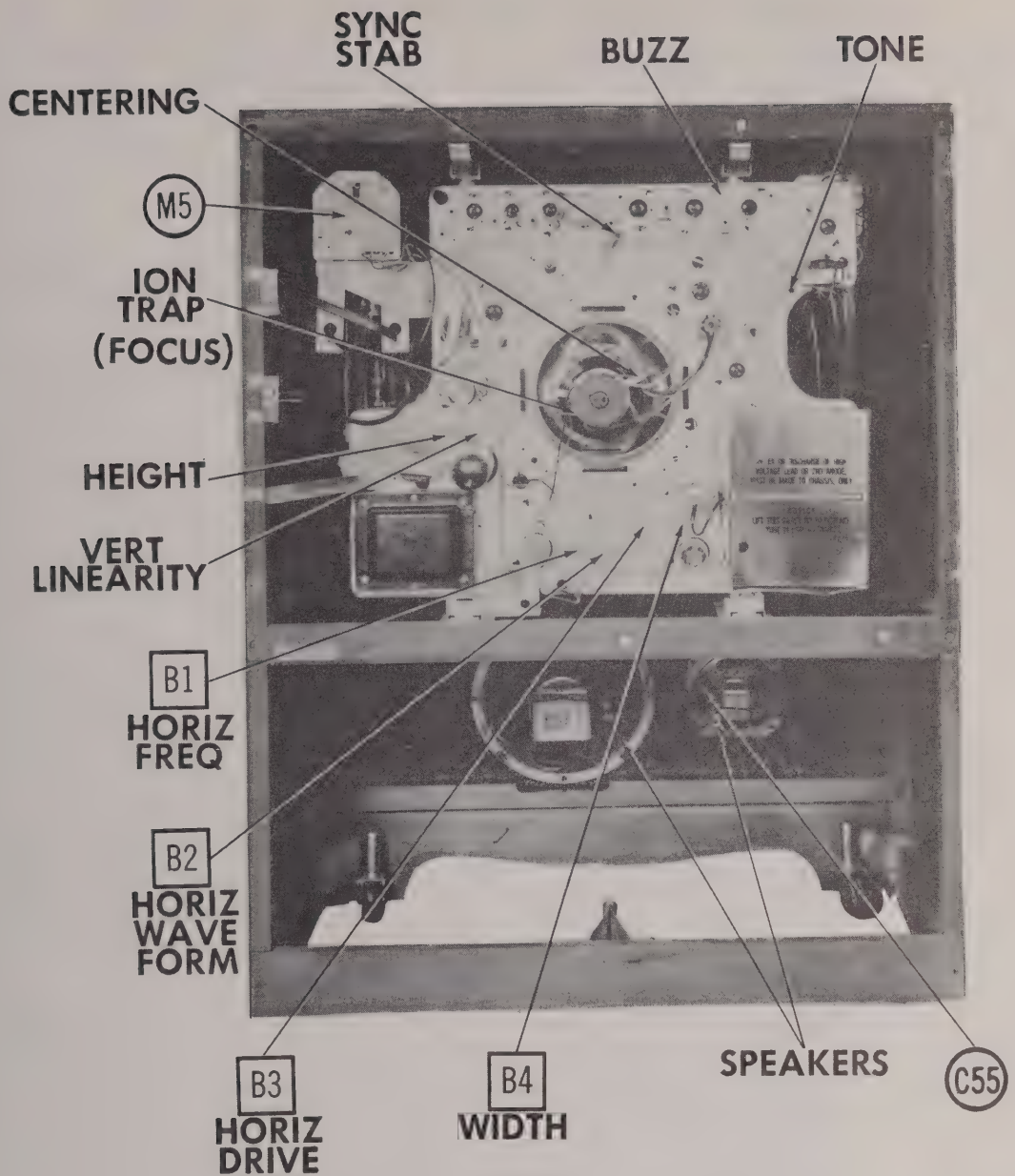
1) Drill new mounting hole(s).
2) Alternate part number.
3) Use 8 to 1 turns.
4) Connect as auto transformer.
5) Cut and tape green lead.
6) Includes resistor R95 and R96.
7) Use original rear cover and centering device.
8) Use original horiz. sweep damping network.
9) Take rear cover and centering device.
10) Do not use tap.
11) Connect to coded red and blue terms.
12) This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Hallodrson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	9	9	9	8	8	9	9
	4	7	7	7	7	1	7	7
	3	7 Note ⑫	7 Note ⑫	7 Note ⑫	7 Note ⑫	1 Note ⑫	7 Note ⑫	7 Note ⑫
	2	Note ⑫	Note ⑫	Note ⑫	Note ⑫	Note ⑫	Note ⑫	Note ⑫
	1	3	3	3	3	3	3	3
	5	1	1	1	1	4	1	1
Connect Width Coil Across	1 & 6	Terms #1 & #9 of RF800 Across 3 & 1	MWC-11 Across 3 & 1	212R1 Across 3 & 1	20IR16 Across 3 & 1	6 & 7	WC-18 Across 3 & 1	Red & Blue Terms of WC-12 Across 3 & 1
Special Notes		⑬	⑬	⑬	⑬	⑭	⑬	⑬

⑫ Connect approx. 100-150MMF ③ 5KV in series with resistor R114 & connect across horiz. yoke terms #3 & #7.
⑬ Change values of resistor R81 & R83 as necessary to obtain required peak to peak pulse voltage at plate of V9, AGC keyer tube.
⑭ Ground either term #6 or term #7.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and turn the horizontal hold control fully clockwise. Tune in a TV station and adjust the horizontal frequency slug (B1) until the picture is just about to tear out of sync at the top of the picture.

Connect the vertical amplifier of the scope to point (E). Low side to chassis. With the picture in sync adjust B2 for equal peaks of the waveform as in Fig. 6. Turn the horizontal drive trimmer (B3) clockwise until white vertical lines appear in the left center of the screen and then turn counter clockwise until the white vertical lines disappear.

Adjust the width slug (B4) for a picture slightly wider than necessary to fill the picture mask horizontally.

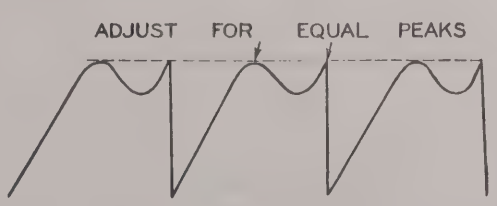


FIG. 6

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	Wells-Gardner PART No.	NOTES
L8A	RF & Osc. Coils	31M-113. IU	Channel 1 - Includes complete 41MC coil board assembly.

ITEM No.	USE	Wells-Gardner PART No.	NOTES
L9	Converter Plate Coil	31K-264	

ITEM No.	USE	REPLACEMENT DATA				NOTES
		Wells-Gardner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L10	39MC Trap	9A2369		TV-152	6225	
L11	1st Video IF	9A2365		TV-131	6225	
L12	2nd Video IF	9A2363			6222	Includes 47. 25MC trap.
L13	3rd Video IF	9A2364			6221	Includes 41. 25MC trap.
L14	Series Peaking Coil	9A2375	19-3036	TV-180	6176	30 Microhenries
L15	Series Peaking Coil	36A35	19-3093■	TV-181■	6177■	82 Microhenries; Wound on 3900Ω resistor.
L16	Shunt Peaking Coil	36A34	19-4400	TV-190	6134	360 Microhenries
L17	4. 5MC Trap	9A2382				
L18	Shunt Peaking Coil	36A36	19-3100	TV-181	6177	100 Microhenries
L19	Shunt Peaking Coil	36A1	19-3100▲	TV-181▲	6177▲	100 Microhenries; Wound on 270Ω resistor.
L20	Series Peaking Coil	36A12	19-4160♦	TV-184♦	6120♦	160 Microhenries; Wound on 22K resistor.
L21	Shunt Peaking Coil	36A37	19-3250▲	TV-185▲	6181▲	235 Microhenries; Wound on 8200Ω resistor.
L22	1st Sound IF	9A2383				Includes 56MMF cap.
L23	2nd Sound IF	9A2368	17-3495	TV-113	6203	Includes 22MMF cap.
L24	3rd Sound IF	9A2368	17-3495	TV-113	6203	Includes 22MMF cap.
L25	Quadrature Coil	9A2367	20-1005		1480	
L26	RF Choke	9A2380	19-1001		4604	1. 5 Microhenries

■ Parallel with 3900Ω resistor.
▲ Parallel with 270Ω resistor.
♦ Parallel with 22K resistor.
▲ Parallel with 8200Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Wells-Gardner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L27	79Ω		9A2371			6211*				Horiz. Freq. - Tap ⓐ 55Ω
L28	58Ω		9A2372							Horiz. Waveform

* Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	Wells-Gardner PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L29	. 270A	40Ω	. 9HY	52X95-5	C5037 ①	C-2996①	C-2326①	26C44 ①	C-23X ①

① Drill one new mounting hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Wells-Gardner PART No.	REPLACEMENT DATA	
K1	Vertical Intergrator	2000MMF, 5000MMF, 5000MMF, 22K, 8200Ω, 8200Ω	76X7	Aerovox Centralab Cornell-Dubilier Erie Sprague	PA-110 PC-100 115TM1 1405-01 V-1

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Wells-Gardner PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	. 4A 125V	16X162	16X163	333. 400 (N - . 4A)	346009	N 4/10	HN 3/10 to 1/2

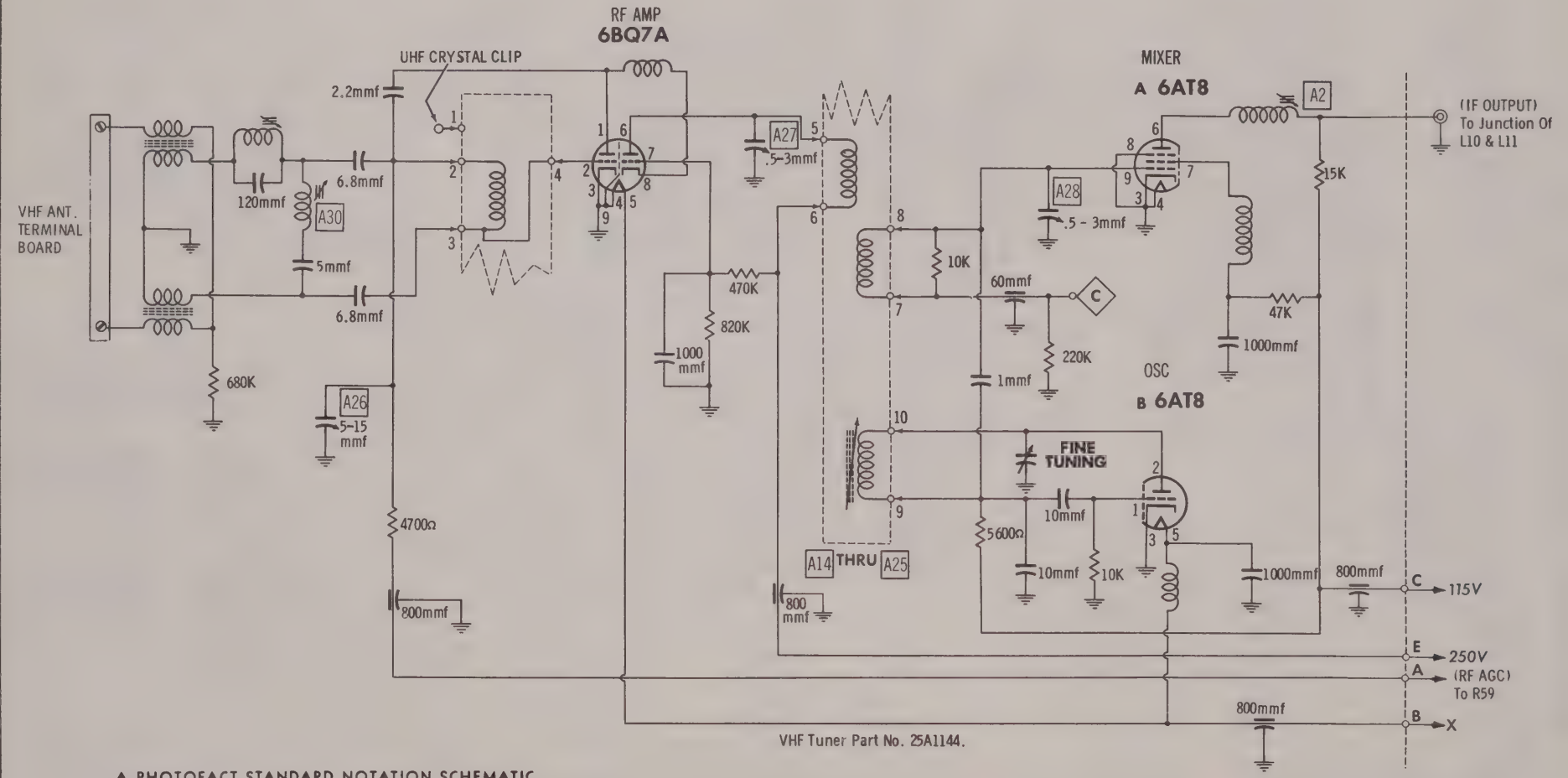
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		Wells-Gardner PART No.	SYLVANIA PART No.	
M2	1N82A	31K-111	1N82A	UHF Mixer (Clip In)
M3	1N60*		1N60	Video Detector (Pigtail)

* CK706A may be used in some versions.

MISCELLANEOUS

ITEM No.	PART NAME	Wells-Gardner PART No.	NOTES
M4	Pilot Light		#15
M5	Tuner	25A1146	UHF/VHF
	Tuner	25A1147	VHF
M6	Ant. Matching Network	31K-225-03	Includes Coils and Caps.
M7	Video Det. Ass'y.	9A2370	Includes 4th Video IF, Series Peaking Coil, M4 and Caps.
M8	Switch	2A464	On-Off, Push Type.
M9	Centering Device	2A435	Includes Yoke Rear Cover.
M10	Ion Trap	2A421	
M11	Trimmer Cap.	17A271	Horiz. Drive (170-700MMF)
	Yoke Clamp	30X611	
	Safety Glass	17X193-1	Tinted, All Models.



VHF Tuner Part No. 25A1144.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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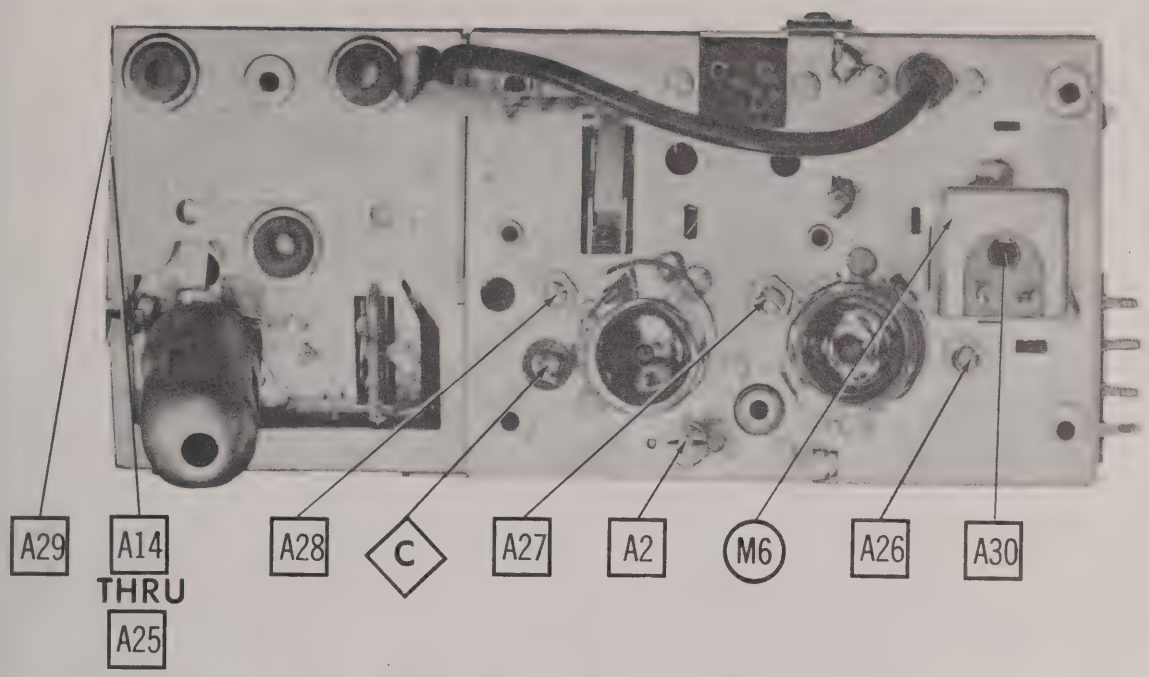
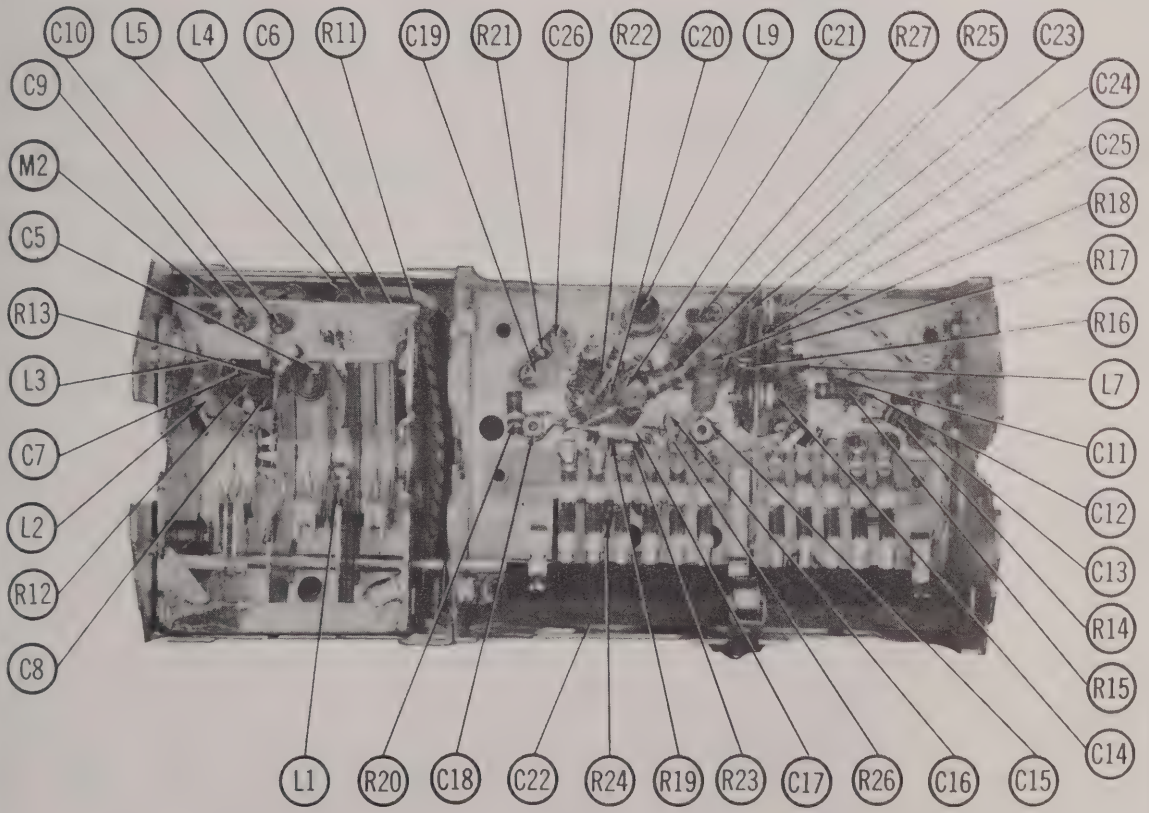
ALTERNATE VHF TUNER SCHEMATIC



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

WHITLEY MODEL
"Murasonde" AP1000

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WHITLEY MODEL
"Murasonde" AP1000

TRADE NAME	Whitley Model "Murasonde" AP1000
MANUFACTURER	Whitley Electronics, Inc., Columbia City, Ind.
TYPE SET	AC Operated 3 Channel Equalizer Preamplifier
TUBES (Five)	Types 12AX7 Preamp.-AF Amp., 12AX7 AF Amp.-Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .55 Amp. @ 117 Volts AC (57 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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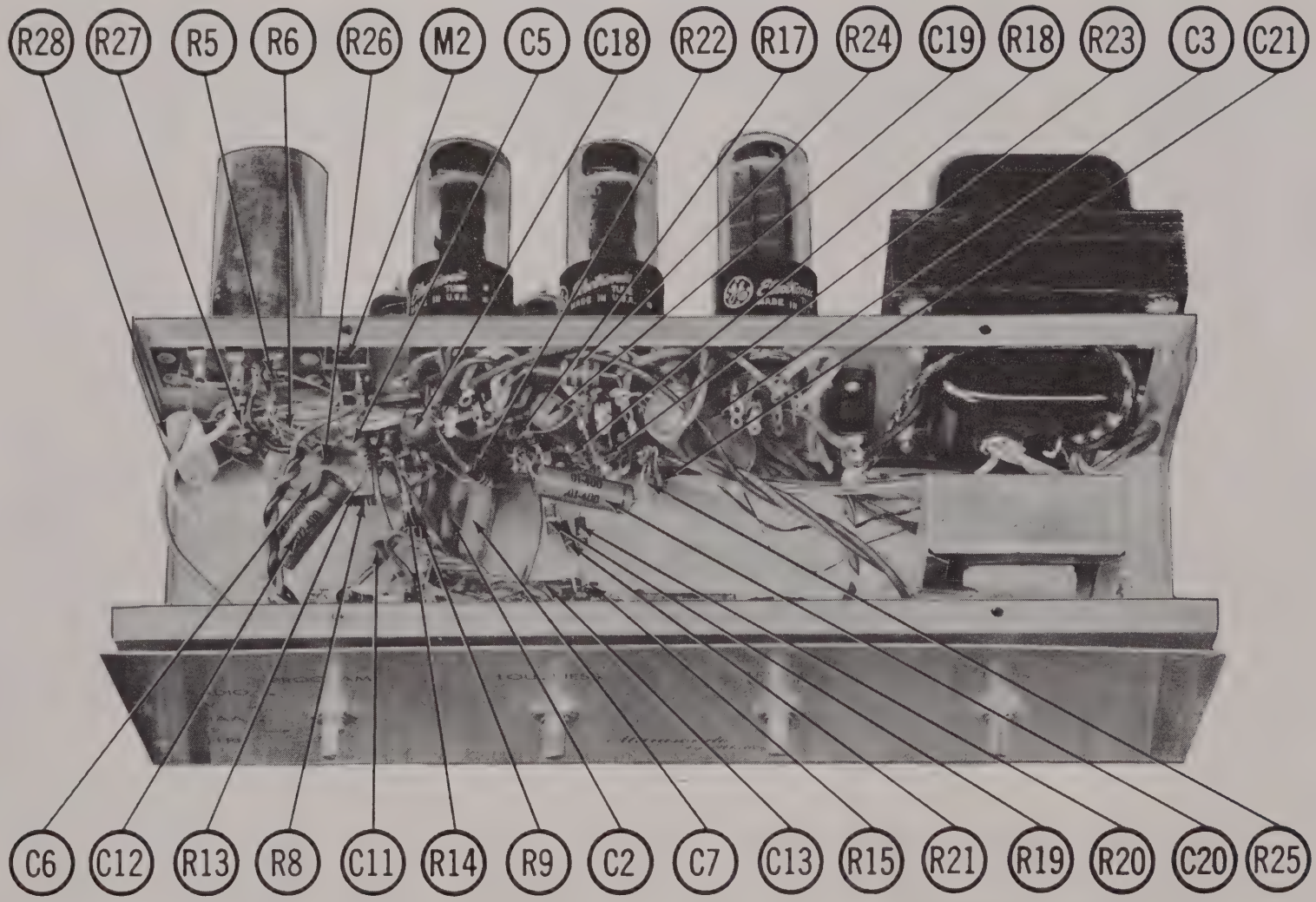


CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Preamp. -1st AF Amp.	12AX7	
V2	2nd AF Amp. -Phase Inv.	12AX7	
V3	Output	6V6GT	
V4	Output	6V6GT	
V5	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA WHITLEY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲60	350		AFH4-94-75	BO340	FP377.4		Q-055	R2388*
B	■55	350			BBRD1145	TC68		FMD-4530	
C	▲10	350							
D	10	350							
C2	50	25		PRS25V50	BBR50-25	TC29	TD-50-25	FM-0250	TVA-1206
C3	50	25		PRS25V50	BBR50-25	TC29	TD-50-25	FM-0250	TVA-1206
C4	5	50	(Note 1)	PRS50VNP4	BR1015]† BR1015]†	TC32]† TC32]†		MT-0510]† MT-0510]†	R2415*

Note 1: Non-polarized unit.
* Non catalog item.
† Connect negative leads together.

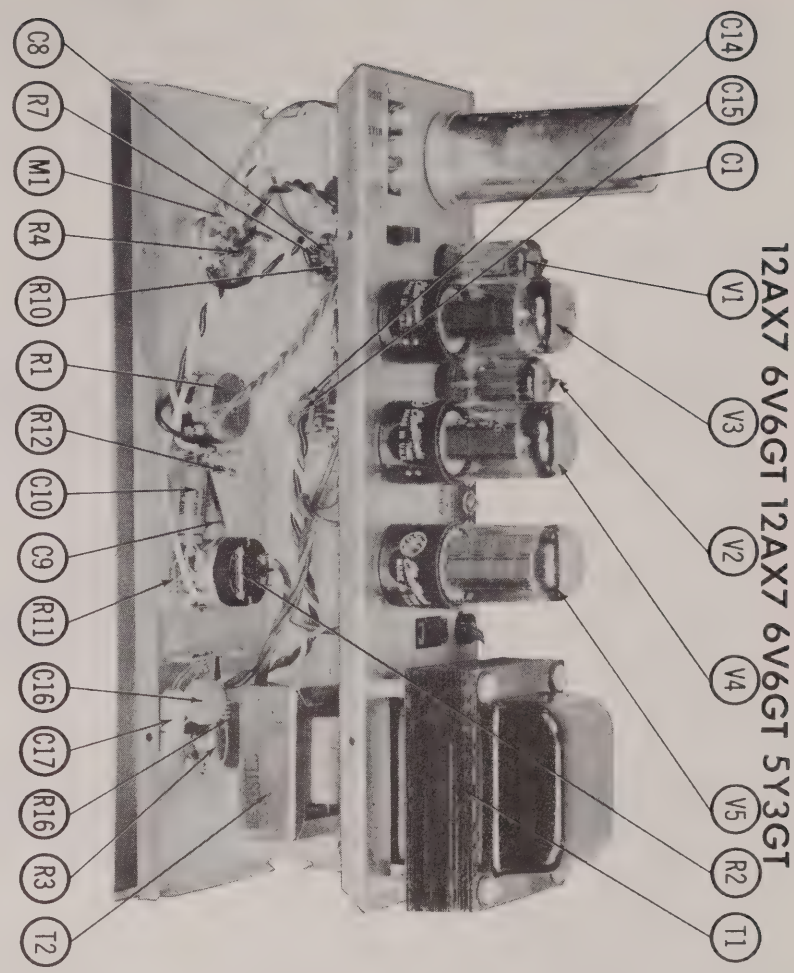
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA WHITLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	150			BPD-00015	DD-151	L10T15	ED-150	UC-5315	5GA-T15	
C6	4000			BPD-004	DD-402	BYA10D4	ED-004	UC-5240	5HK-D4	Note 1
C7	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C8	150			1468-00015	DD-151	5W5T15	ED-150	UC-5315	1FM-315	
C9	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C10	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C11	220			BPD-00022	DD-221	L10T22	ED-220	UC-5322	5GA-T22	
C12	.022	400		BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	Note 4
C13	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C14	4000			BPD-004	DD-402	BYA10D4	ED-004	UC-5240	5HK-D4	Note 2
C15	1000			BPD-001	DD-102	BYA6D1	ED-001	DC521	5HK-D1	Note 3
C16	4000			BPD-004	DD-402	BYA10D4	ED-004	UC-5240	5HK-D4	Note 2
C17	.001	600		BPD-001	DD-102	CUB6D1	GP-1000	GEM-621	6TM-D1	Note 3
C18	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	Note 2
C19	.047	400		BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	Note 2
C20	.01	400		BPD-01	DD-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C21	470			BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	5GA-T47	

Note 1: Some versions may use 4700MMF in this application.
Note 2: Some versions may use 5000MMF in this application.
Note 3: Not used in some versions.
Note 4: Some versions may use 20000MMF in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WHITLEY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	220003	B-60	A47-500K-Z			Loudness
B	Shaft			Not Req.	FS-3			
R2A	100K	½	220001	B-40	A47-100K-S			Treble
B	Shaft			Not Req.	FS-3			
C	Switch			KB-1	SWE-12			
R3A	1Meg	½	220002	B-69	A47-1Meg-S			Bass
B	Shaft			Not Req.	FS-3			

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WHITLEY PART No.	IRC PART No.	
R4	150K			BTS-150K	
R5	10K			BTS-10K	
R6	120K			BTS-120K	
R7	560K			BTS-560K	Note 1
R8	68K			BTS-68K	
R9	1500Ω			BTS-1500	
R10	220K			BTS-220K	
R11	27K			BTS-27K	
R12	390K			BTS-390K	
R13	100K			BTS-100K	
R14	1500Ω			BTS-1500	
R15	220K			BTS-220K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WHITLEY PART No.	IRC PART No.	
R16	47K			BTS-47K	
R17	470K			BTS-470K	
R18	470K			BTS-470K	
R19	1500Ω			BTS-1500	
R20	22K 5%			BTS-22K 5%	
R21	5600Ω 5%			BTS-5600 5%	
R22	470K 5%			BTS-470K 5%	
R23	470K			BTS-470K	
R24	270Ω	2		BTB-270	Note 2
R25	68K			BTS-68K	
R26	47K	1		BTA-47K	
R27	8200Ω	1		BTA-8200	
R28	400Ω	7			

Note 1: Some versions may use 470K in this application.
Note 2: Some versions may use 250Ω , 2W in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	WHITLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ② .55A	610VCT ② .070A	5V ② 2A	6.3VCT ③ 1.44A		P9305		PM8408	22R04	R-9B

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

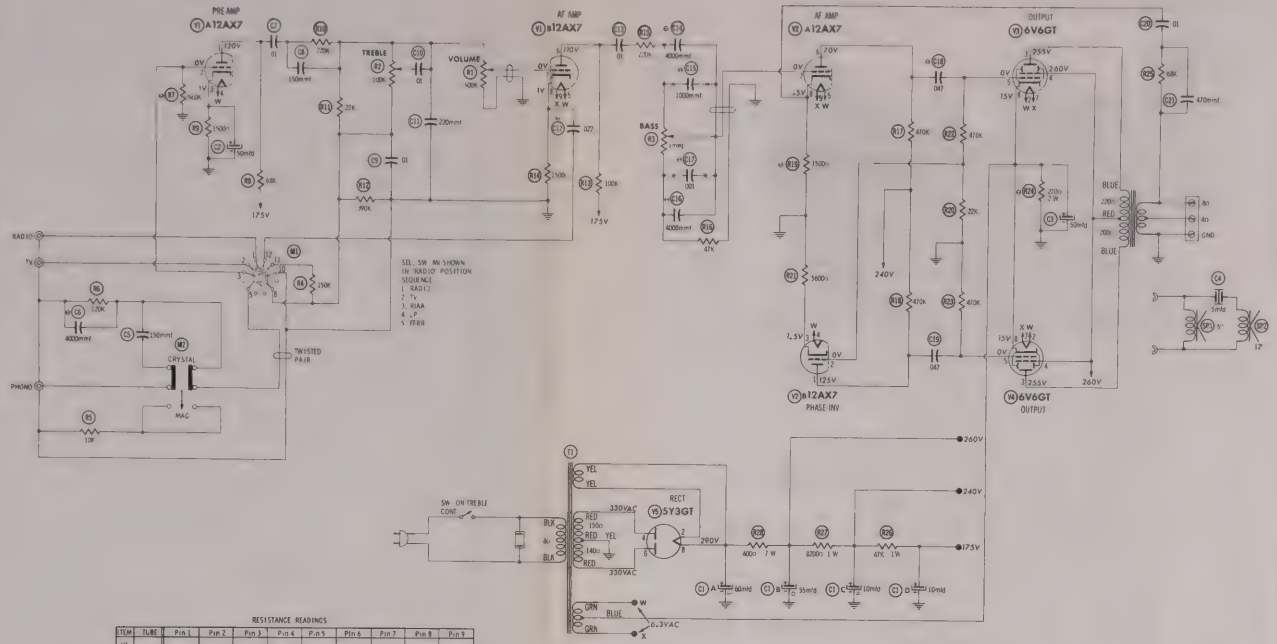
ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	WHITLEY PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7000Ω CT	8Ω Tap ② 4Ω	1895	Z1404 ①	A-3027	A-3831 ①	24S56 ①		① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	WHITLEY PART No.	QUAM PART No.	
SP1	5"	PM	10Ω	V5D6		
SP2	12"	PM	6-8Ω	V12J65	12A10X	

MISCELLANEOUS

ITEM No.	PART NAME	WHITLEY PART No.	NOTES
M1	Switch		Function Selector (Rotary, Wafer Type) (8 Pole, 5 Position)
M2	Switch		Mag-Xtal (Slide Type, DPDT)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†325K	560K	1500Ω	270Ω	270Ω	†160K	0Ω	1500Ω	270Ω
V2	12AX7	†480K	22K	5600Ω	270Ω	270Ω	†480K	47K	1500Ω	270Ω
V3	6V6GT	TP	270Ω	†620Ω	†400Ω	500K	NC	270Ω	270Ω	
V4	6V6GT	TP	270Ω	†600Ω	†400Ω	470K	TP	270Ω	270Ω	
V5	5Y3GT	NC	20K (Min)	NC	150Ω	NC	140Ω	NC	20K (Min)	

† MEASURED FROM PIN 8 OF V5.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊙ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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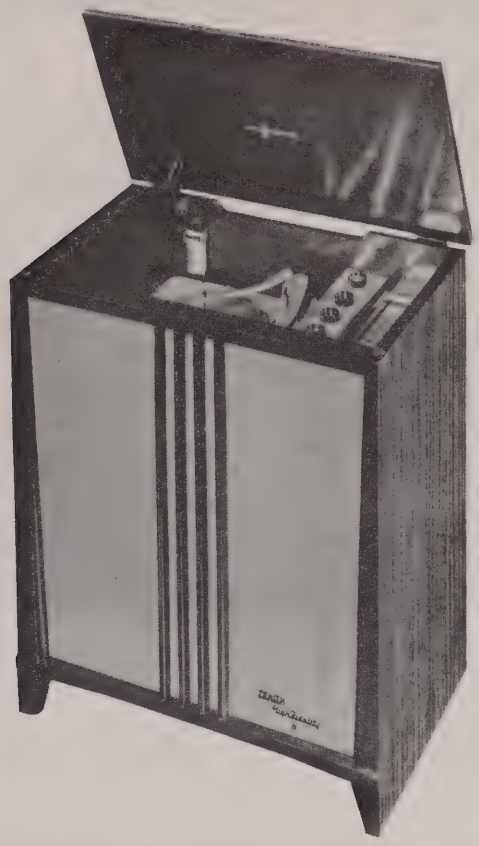
ZENITH MODELS HF772E,H, R, HFZ772E,H, R (Ch. 7Z20)



PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

ZENITH MODELS HF772E,H, R, HFZ772E,H, R (Ch. 7Z20)

MODEL HF772R

TRADE NAME	Zenith Models HF772E, H, R; HFZ772E, H, R (Ch. 7Z20)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.
TYPE SET	AC Operated AM Receiver With 4 Speed Automatic Record Changer
TUBES (Seven)	Types 6BE6 Converter, 6BA6 IF Amplifier, 6BF6 Det-AVC-AF Amp., 12AX7 AF Amp. -Phase Inv., (2) 6V6GT Output, 5U4GA Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycles RATING .85 Amp. @ 117 Volts AC (88 Watts)
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in the same relative position to chassis as when the receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.5MFD	High side to pin 7 (grid) of 6BE6 (V1). Low side to chassis.	455KC (400~ Mod)	600KC	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	"

FOR SERVICE INFORMATION ON RECORD CHANGER PART #S-14073 -- SEE SIMILAR V-M MODEL 1200A - PHOTOFACT SET 353 FOLDER 16.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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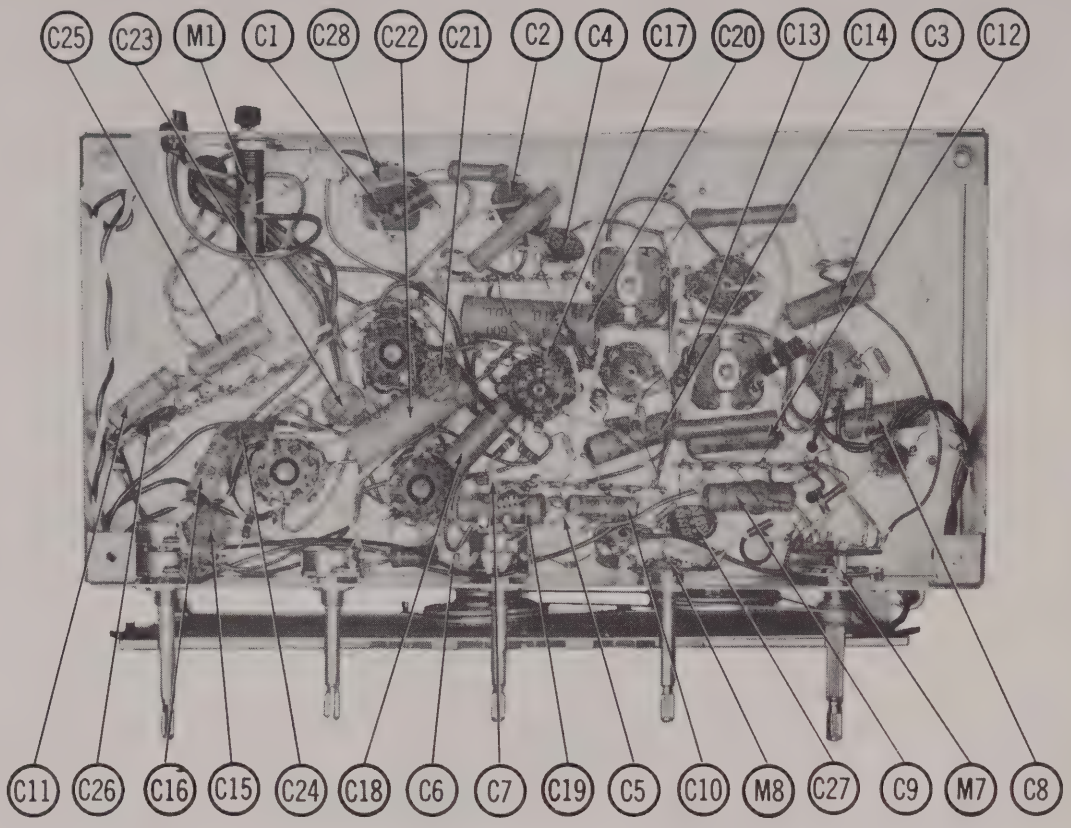
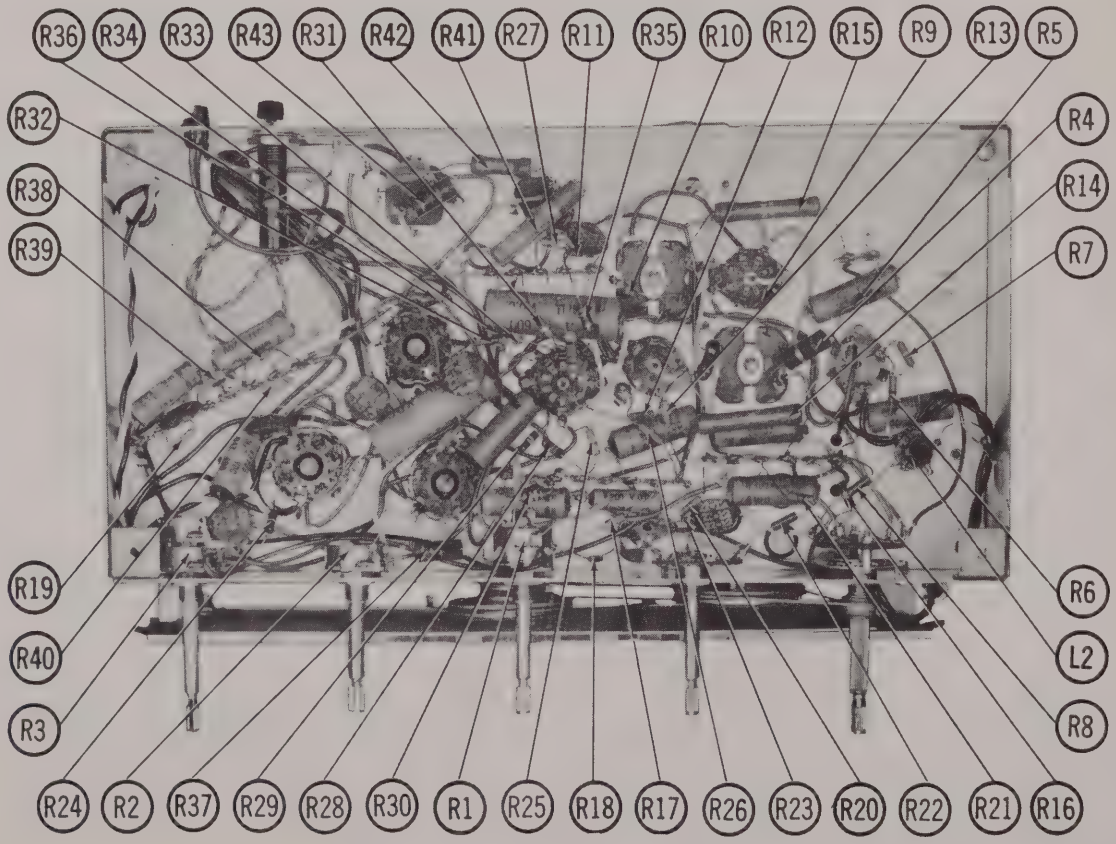


CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	6BE6	
V2	IF Amplifier	6BA6	
V3	Det-AVC-AF Amp.	6BF6	
V4	AF Amp. -Phase Inv.	12AX7	

ITEM No.	USE	TYPE	NOTES
V5	Output	6V6GT	
V6	Output	6V6GT	
V7	Rectifier	5U4GA	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450	22-1612	AFH2-57	BO450	FP238	TMD-54	D-235	TVL-2764
B	▲40	450							
C2A	■20	350	22-2905	AFH2-37	BO300	FP227	TMD-35	D-160	TVL-2626
B	▲20	350							

FIXED CAPACITORS

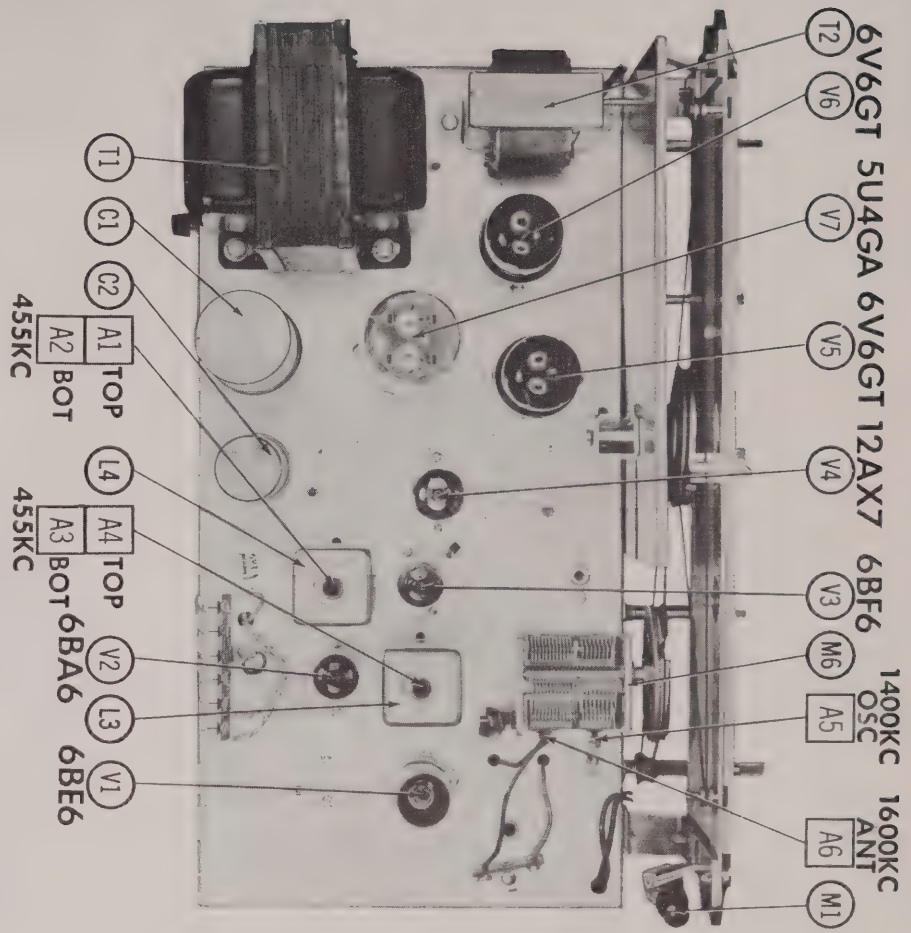
Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	. 047	400	22-2793	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C4	100		22-5	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C5	10000		22-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C6	22		22-2903	BPD-000022	DD-220	L10Q22	ED-22	UC-5422	5GA-Q22	
C7	10000		22-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C8	. 047	200	22-2792	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C9	. 047	200	22-2795	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C10	. 01	200		BPD-01	DD-103	CUB4S1	ED-01	GEM-411	4TM-S1	
C11	. 022	200	22-2807	BPD-02	DD-203	CUB4S22	ED-02	GEM-4122	4TM-S22	
C12	. 047	400	22-2793	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C13	470		22-2302	SI 470	D6-471	LT6T47	GP-470	UC-5347	5GA-T47	
C14	. 047	400	22-2793	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C15	1000	1000	22-17	HVD15-1000	DD-102	BYA10D1M	HD15-1000	DC3021	5HK-D1	
C16	. 047	400	22-2793	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C17	560		22-2310	SI 560	D6-561	LT6T56	GP-560	UC-5356	5GA-T56	
C18	. 047	400	22-2793	BPD-05	DF-503	CUB4S47		GEM-4147	4TM-S47	
C19	. 047	200	22-2795	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C20	. 1	600	22-2782	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C21	1000	1000	22-17	HVD15-1000	DD-102	BYA10D1M	HD15-1000	DC3021	5HK-D1	
C22	. 1	600	22-2782	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C23	4700		22-14	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C24	4700		22-14	BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5HK-D47	
C25	. 047	200	22-2792	BPD-05	DF-503	CUB2S47		GEM-4147	2TM-S47	
C26	100		22-5	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	
C27	1500		22-12	BPD-0015	DD-152	L10D15	ED-0015	DC5215	5HK-D15	
C28	10000		22-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	63-3682	BT-82	A47F3-2Meg	Q18-139X	UT451	Loudness, Tap@ 1Meg
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1	SWE-12	76-1	US-26	
R2	50K	½	63-3683	B-34		Q14-123		Presence
R3A	3Meg	½	63-3681					Bass
B	500K	½						Treble

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R4	5600Ω	2	63-3223	BTB-5600	
R5	18K			BTS-18K	
R6	1000Ω			BTS-1000	
R7	22K			BTS-22K	
R8	2. 2Meg			BTS-2. 2Meg	
R9	68Ω			BTS-68	
R10	47K			BTS-47K	
R11	220K			BTS-220K	
R12	10Meg			BTS-10Meg	
R13	120K			BTS-120K	
R14	8200Ω	4	63-3602	PW4-8200	
R15	5600Ω	4	63-3685		
R16	10K			BTS-10K	
R17	47K			BTS-47K	
R18	2200Ω			BTS-2200	
R19	33K			BTS-33K	
R20	15Meg			BTS-15Meg	
R21	1Meg			BTS-1Meg	
R22	2. 2Meg			BTS-2. 2Meg	
R23	470K			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R24	220K			BTS-220K	
R25	470K			BTS-470K	
R26	220K			BTS-220K	
R27	15K			BTS-15K	
R28	3300Ω			BTS-3300	
R29	10K			BTS-10K	
R30	39K			BTS-39K	
R31	220K			BTS-220K	
R32	220K			BTS-220K	
R33	270K			BTS-270K	
R34	220K			BTS-220K	
R35	3300Ω			BTS-3300	
R36	33K			BTS-33K	
R37	220Ω	2	63-3158	BTB-220	
R38	150K			BTS-150K	
R39	4700Ω			BTS-4700	
R40	4700Ω			BTS-4700	
R41	1200Ω	2	63-1489	BTB-1200	
R42	2700Ω	3	63-3684		
R43	120Ω	2	63-2281	BTB-120	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .85A	660VCT @ .104A	5VAC @ 3A	6. 3VCT @ 2. 4A	95-1525	P9312 ①	P-3153 ①	PC8422 ①		R-14A ①

① Fabricate mounting.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	8000Ω CT	3-4Ω	95-1526						
	Turns	Ratio							
	PRI.	SEC. 2							
	10. 3	: 1							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	12"	PM	6-8Ω	49-802 ①	12A6 ①	① Parallel & phase.
SP2	12"	PM	6-8Ω	49-802 ①	12A6 ①	② Electrostatic type.
SP3				S-24510 ②		
SP4				S-24510 ②		

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	S-40420				
L2	Osc. Coil	S-40389			69-Osc.	
L3	Input IF	95-1101	16-6666	BC-368	12-C1	
L4	Output IF	95-1102	16-6770*	BC-355*	12-C6*	* Use adaptor plate.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			ZENITH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A 250V	136-36	62-17*	312002. (3AG-2A)	342001	AGC 2	HKP

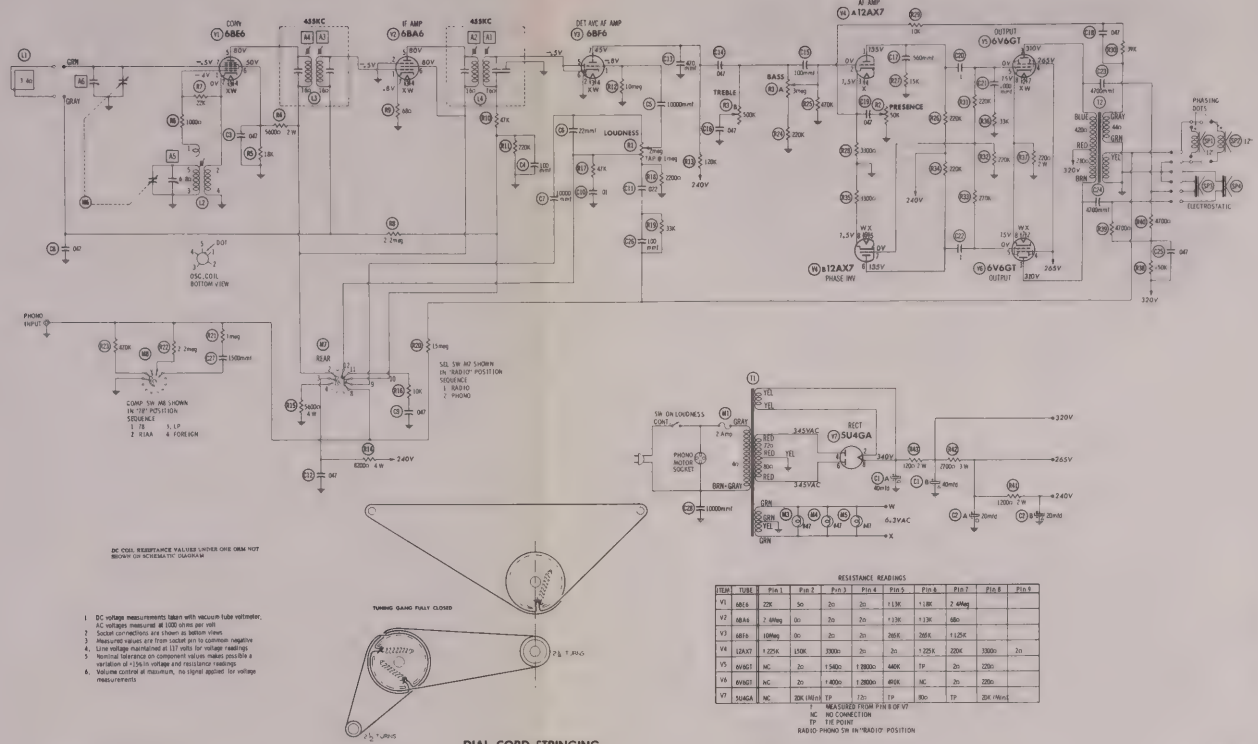
* Fuse holder cap, part #15-115.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	ZENITH PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M2	142-80			56	*PT-1	* Not required unless original mtg. bracket is damaged.

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Pilot Light	100-67	#47 (Radio)
M4	Pilot Light	100-67	#47 (Radio)
M5	Pilot Light	100-67	#47 (Phono)
M6	Tuning Cap.	22-2904	Two Gang (17-365MMF, 25-130MMF)
M7	Switch	85-582	Radio-Phono, Rotary Wafer Type
M8	Switch	85-581	Record Compensator, Rotary Wafer Type
	Dial Glass	192-229	
	Pointer	59-322	
	Knob	46-1020	Function, Record Compensator, Volume, Presence, Model HF772R.
	Knob	46-1357	Function, Record Compensator, Volume, Presence, Model HF772E, H.
	Knob	46-1639	Tuning
	Knob	46-1640	Bass
	Knob	46-1641	Treble, Model HF772R.
	Knob	46-1642	Treble, Model HF772E, H.
	Cabinet	14-2092R	Model HF772R.
	Cabinet	14-2092H	Model HF772H.
	Cabinet	14-2092E	Model HF722E.



DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BE6	22K	56Ω	2Ω	2Ω	↑13K	↑18K	2.4Meg		
V2	6BA6	2.4Meg	0Ω	2Ω	2Ω	↑13K	↑13K	68Ω		
V3	6BF6	10Meg	0Ω	2Ω	2Ω	265K	265K	↑125K		
V4	12AX7	↑225K	470K	3300Ω	2Ω	2Ω	↑225K	220K	3300Ω	2Ω
V5	6V6GT	NC.	2Ω	↑540Ω	↑2800Ω	440K	TP	2Ω	220Ω	
V6	6V6GT	NC.	2Ω	↑400Ω	↑2800Ω	490K	NC.	2Ω	220Ω	
V7	5U4GA	NC.	30K (Min)	TP	72Ω	TP	80Ω	TP	25K (Min)	

↑ MEASURED FROM PIN 8 OF V7
NC NO CONNECTION
TP TIE POINT
RADIO-PHONO SW IN "RADIO" POSITION

DIAL CORD STRINGING

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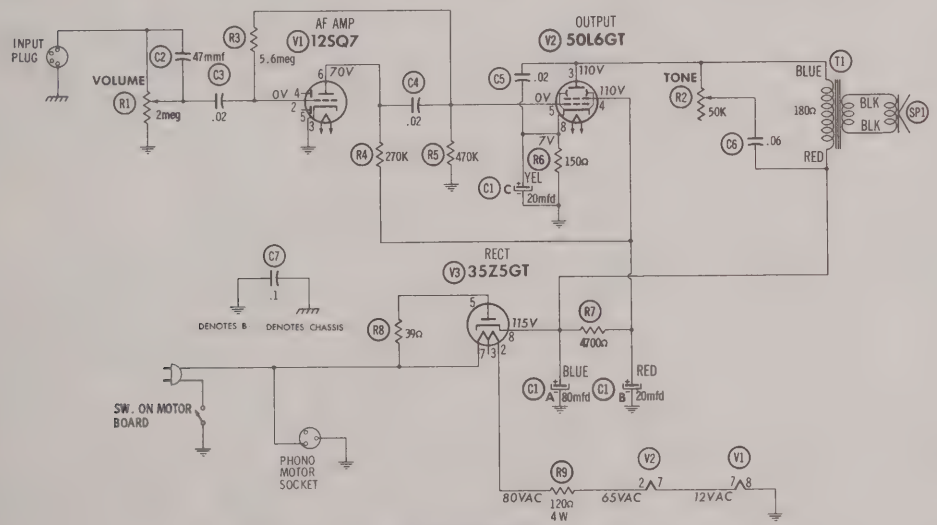
ZENITH
MODEL YP8L

ZENITH
MODEL YP8L

TRADE NAME	Zenith Model YP8L
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12SQ7 AF Amplifier, 50L6GT Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .25 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER S-14067 — SEE SIMILAR V-M MODEL 1200 - PHOTOFACT SET 290 FOLDER 11 OR RECORD CHANGER MANUAL CM-7



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12SQ7	0Ω	6Meg	0Ω	NC	NC	†275K	12Ω	0Ω
V2	50L6GT	NC	65Ω	†180Ω	†4700Ω	470K	NC	12Ω	150Ω
V3	35Z5GT	NC	185Ω	210Ω	NC	260Ω	NC	220Ω	15K

† MEASURED FROM PIN 8 OF V3.
NC NO CONNECTION

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12SQ7	
V2	Output	50L6GT	
V3	Rectifier	35Z5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	WC11504	AFH3-80	BBRT8215C	WQ230	TML-1	FMT-333	R2199*
B	20	150							
C	20	25							

* Non Catalog Item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	47			BPD-000047	DD-470	G033	831-470	UC-5447	5GA-Q47	
C3	.02	200		BPD-02	DD-203	CUB2S2	817-02	PT412	2TM-S2	
C4	.02	200		BPD-02	DD-203	CUB2S2	817-02	PT412	2TM-S2	
C5	.02	200		BPD-02	DD-203	CUB2S2	817-02	PT412	2TM-S2	
C6	.06	200		P688N-06		CUB6S6		PT616	6TM-S6	
C7	.1	200		P288N-1	DF-104	CUB2P1		PT401	2TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	2Meg	1/2	WC11512					Volume & Switch
R2	50K	1/2	WC11507					Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R3	5.6Meg			BTS-5.6Meg	
R4	270K			BTS-270K	
R5	470K			BTS-470K	
R6	150Ω			BTS-150	
R7	4700Ω			BTS-4700	
R8	39Ω			BTS-39	
R9	120Ω	4	63-1500		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	WC10509	Z1101	A-3025	A-3332	26S58	S-12X	
	2400Ω	3-4Ω	95-1404 ①	Z1101	A-3025	A-3332	26S58	S-12X	① Alternate Part

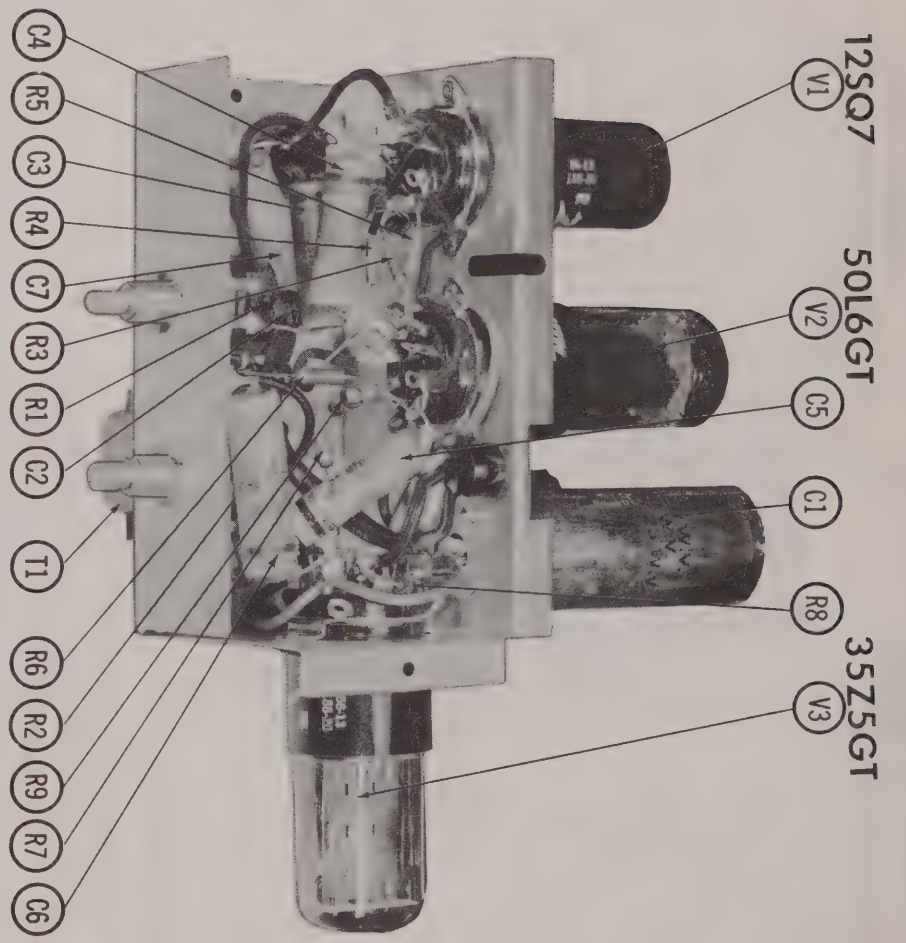
SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	WC10901	52A1	
	5 1/4"	PM	3-4Ω	49-751 ①	52A1	① Alternate Part

PHONO CARTRIDGE

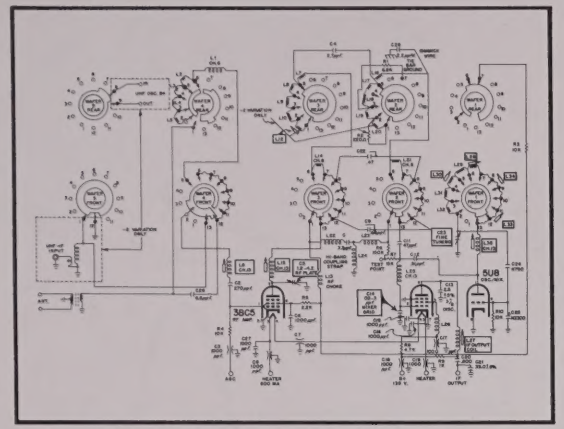
ITEM No.	REPLACEMENT DATA					REMARKS
	ZENITH PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	MOUNT	
M1				56	*PT-1	Not required unless original mounting is damaged.

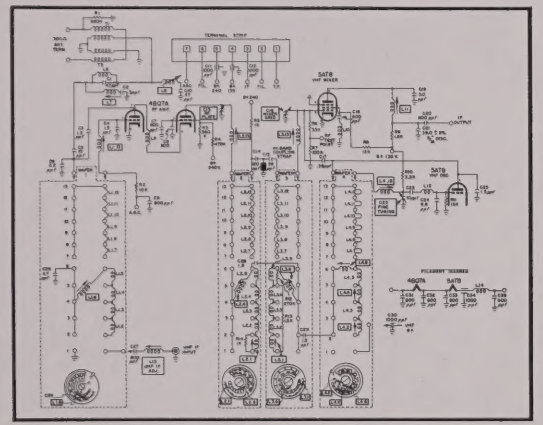
CHASSIS—BOTTOM VIEW



MISCELLANEOUS

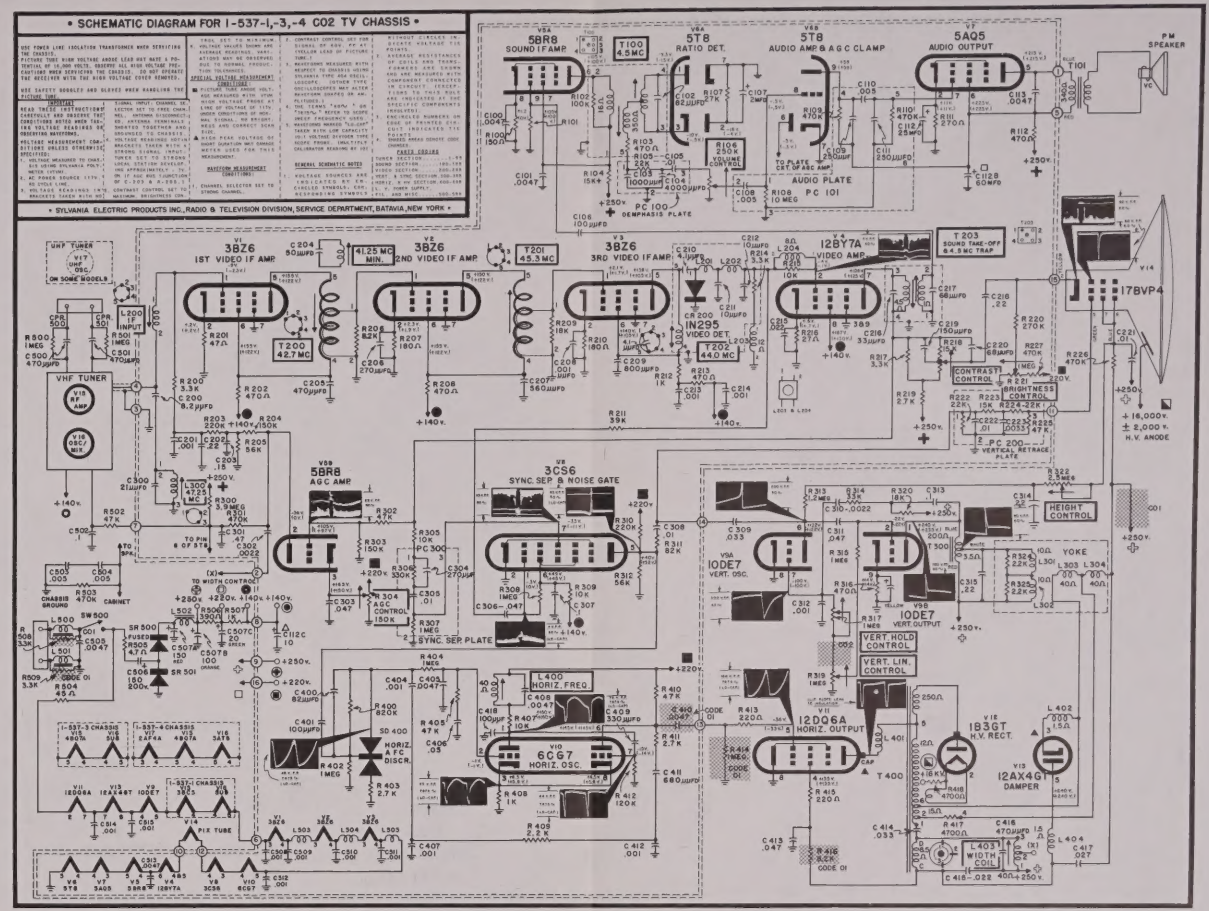
ITEM No.	PART NAME	ZENITH PART No.	NOTES
	Case	WC12047	Complete
	Knob	WC12001	On-Off-Volume & Tone
	Handle	WC11845	



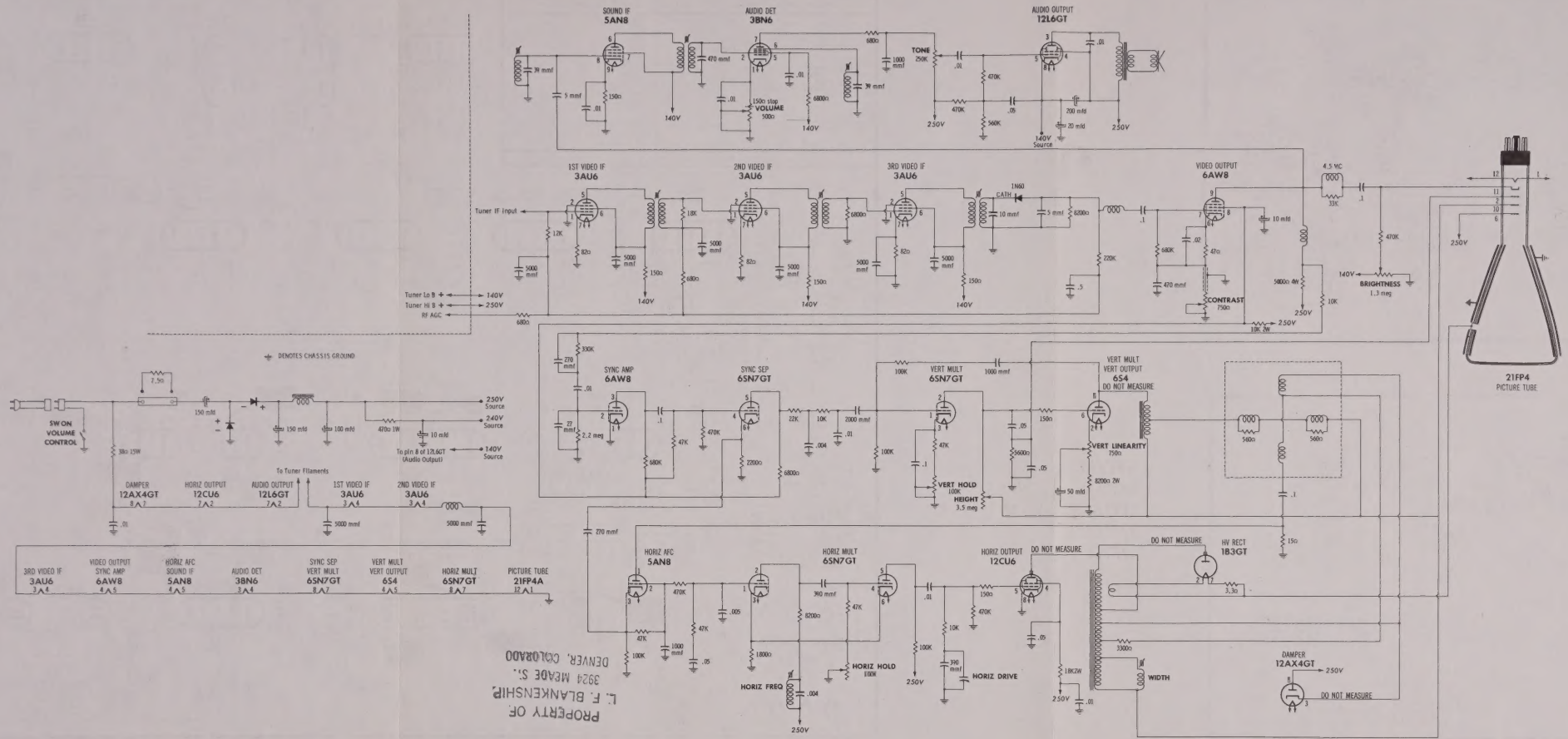


SYLVANIA

MODELS	CHASSIS
17P101	1-537-1, -3, -4
17P102	"
17P201	"



SCHEMATIC COURTESY OF SYLVANIA ELECTRIC PRODUCTS INC.



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AMERICAN TELEVISION MODEL 9081A (1955)

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